

A

Harrison co 1908

Monona co.

Cup anemometer

50 revol. = $\frac{1}{10}$ mile

Cups travel $\frac{1}{3}$ distance
wind goes.

5749

12.51

12.46

X 0678
049
010
3810

12.35-12.40

6409

12.30-12.35

July 31 to Aug. 6 - 1908
Tested apparatus & packed.

Aug. 7-

went to Burlington. Looked
over field for meteorological
station. (At the ecology & loam.)

For timbered W. side will use
Crapo park, - the natural
timbered slopes.

For east side, will use
sandy hills at Gladstone, Ill.
(S. E. of town).

Aug. 8 - Packed & arranged notes,
etc.

Aug. 9, 1908.

Left Iowa City at 5 AM.
Stopped at Des Moines, &
with Mr. J. H. Lees went up
river on E. side to place
where excavating of bluffs is
going on.

Saw:

Wisconsin drift

ashen loess
forms & boulders

Fertile zone - no other drift
sand stone.

Little band.

Shale
(dark, black)

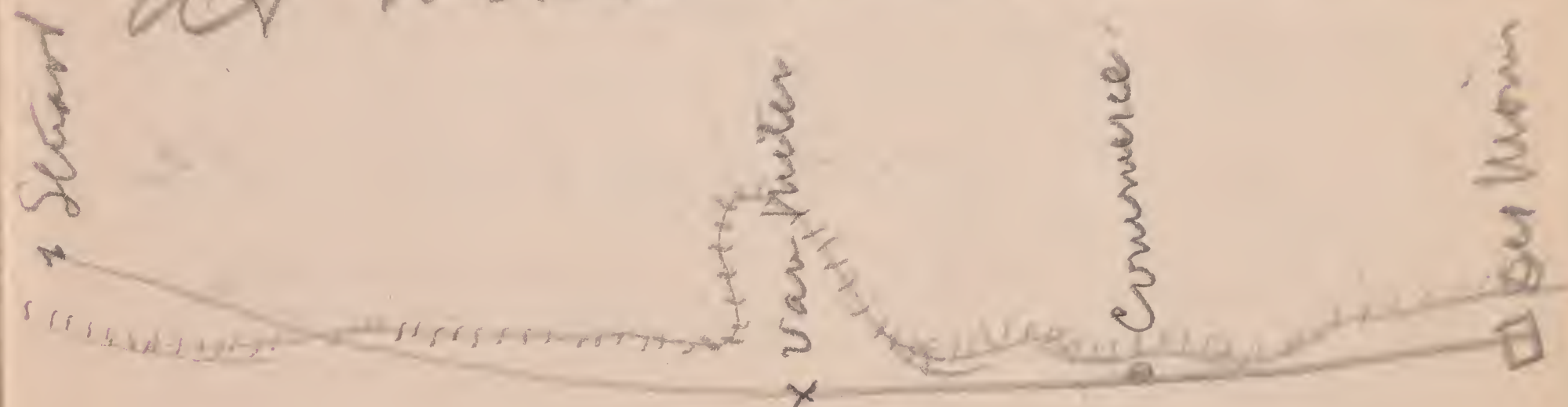
Must return to this. It
was so muddy (rained all
AM.) that I could do
nothing.

Left Des Moines at 11:25 AM.

From Des Moines to Van Meter
the Wisconsin moraine is
distinct, and just N. of the
C.R. & P. RR., + of the river.
At De Soto we ran into
rough country, - some rock.
Some distance W. of De Soto
the moraine crosses track &
follows south of RR. to Dexter.
Northward there is a flat
plain, - Wisconsin.

At Stuart the moraine is
a little farther south from
RR. Flat plain north.

At Menlo much the same.



Just beyond Mendon we
ran into rougher country
& some cuts appear.

At Casey quite rough, -
some timber, & some, mostly
overgrown, cuts.

Between Casey & Adair
there is rough Kansan
topography. Cuts show, but
more or less overgrown.

Big cut W. of Adair shows
yellow drift. Another cut
shows drift almost to top.

Rolling Kansan to Atlantic,
& thence to C. Bluffs

Reached C. Bluff at 4:15 P.M.,
Left at 4:45 P.M. by C. & W.
for Miami Valley.

The bluffs E. of RR show
brown (dead grass) or yellow

surface on W & S. sides
of slopes & ridges, but
protected sides seem to be
quite green.

The bottomlands are nearly
dry -

Reached Miami Valley
at 5:40 P.M. & put up at
the Miller Hotel

Aug. 10 - (Mon)

Spent early forenoon in
arranging notes and material.

Mr. J. S. Wattle, C. E.

City Engineer of
Mo. Valley.

Blair bridge bed rock is
45 to 50 feet below low
water, dips to W. about
5 ft. (in river bed)
Solid limestone, hard gray
wells for city.

Drive wells. 6 wells - 2 1/2 pipe
60 to 85 ft.

Clogged soon.

Later put in Cork wells
(by hydraulic power) -

80 to 90 ft. - 4 wells.

2 pumps - compound duplex

1 - capacity 1,500,000 gals

2 - " 750,000 "

The RR. wells (4) are about
90 ft. deep. Struck rock

Analysis of water; C. & M. O. chemist
Yes. M. Davidson, Chicago
chemist C. & M. O.
RR. shops.

	Old well	Cork	Water works.	Lake Michigan
These waters contain of solid material				
grains as follows:	33.68	31.12	26.61	7.78
This consists of: (grains per gallon)				
Carb. of lime	17.50	16.35	14.54	4.46
" " magnesia	10.17	5.69	9.24	2.20
Sulphate of lime	Trace	- -	Trace	0.30
A " " magnesia	27.67	3.78	23.78	6.96
oxide of iron & aluminum	Trace	0.15	Trace	0.02
Silica	1.26	1.31	1.64	0.30
B Alkali chlorides	1.30	1.63	0.86	0.22
" Alkali sulphates	3.45	1.32	0.33	0.28

A = incrusting solids

B = non "

Pounds incrusting solids per gal. - RR. 4.13
 " (Cork) RR. 3.90
 " " " (Water works) 3.63
 " " " (Lake Mich.) 1.04

Comparative hardness
of water from:

Long Pine cr., Neb. 3° hardness
Wells at Mo. Valley - 2.5°-3.5° "
Waterworks - " 11° "

Test made at High School
Lab., Mo. Valley, Ia

by E. N. Coleman
Supt.

Decem. 1890.

About 20 yrs ago, at
brewery, an Omaha
co. dug for coal,
as far as bluffs on Mo.
Valley. Tradition has it
that they passed through
6 feet of good coal ("like
Des Moines valley coal").

In afternoon walked out
to ridge above Schneider's
Hollow (beyond city reservoir)
and selected localities for
evaporation, etc., observations.
Took barometric readings, and
checked back on them, - the
difference on the return being
less than 5 ft.

N. side Miller Hotel (about = 8
C. + Mo. depot) = 0.
Top of reservoir hill — 195+

I went N. on 5th str., from
hotel, and near top of ridge
followed road N. and west.

In evening met
Kirkwood, who is back on
a visit. Lives at Long
Pine, Neb.

18th Aug. 11-1908. (did nothing -
rained)

Pans 5 6 7 8 9 10 11

1

2

3

4

Piche

1

2

Cup.

1

2

11

12

1

2

3

4

5

6

7

12 Aug. 11, 1908 (Tuesday)

Got up at 4 o'clock, expecting to make evaporation observations. It was raining, and rained all day, so that I could not get out.

Sorted abbreviations, copied old Harmon co. notes, made blanks for observation records, looked up plants, etc., etc.

A busy, indoor, day.

In evening wrote letters, etc.

Aug. 12, 1908 (Wed.)

13

Left at 8:25 AM. for Logan, as it was raining.

Spent day until 5:30 PM. at co. auditor's office making maps. Walked up the C&N.W. track, past brickyard to cemetery.

The cemetery is located N. of town (not far from RR.) on a ridge which slopes eastward to RR. right of way. This slope is covered with a typical prairie flora. Collected most of the plants, but recorded following, some of which are not in list, - they were here and also: (I do not probably have them ✓).

Verbena stricta	Arnica canescens
Vernonia noveboracensis	Euphorbia
Cassia chamaecrista	corollata
✓ Rhus glabra	✓ Prinospora angustifolia
Kuhnia eupatorioides	Halimolobos grossularis
Lespedeza cuneata	✓ Moronea scabra
Petalostemon candidum	✓ Verbena hastata
Viola	✓ Delphinium
Bontelonia racemosa	etc. etc.
Equisetum hyemale	(See plants.)
✓ Asclepias syriaca	
✓ Cannabis sativa	

along the Boyer, on low bottom
I found some herbs (see list)
and the following native trees:

Salix amygdaloides - Gymnocladus dioica
" americana Ulmus americana
" floridensis Salix nigra

Cottonwood
Green ash.
Box Elder.

also from sand-bar.

On the streets, along roads, etc.
I found the following weeds (see
also specimens of some):

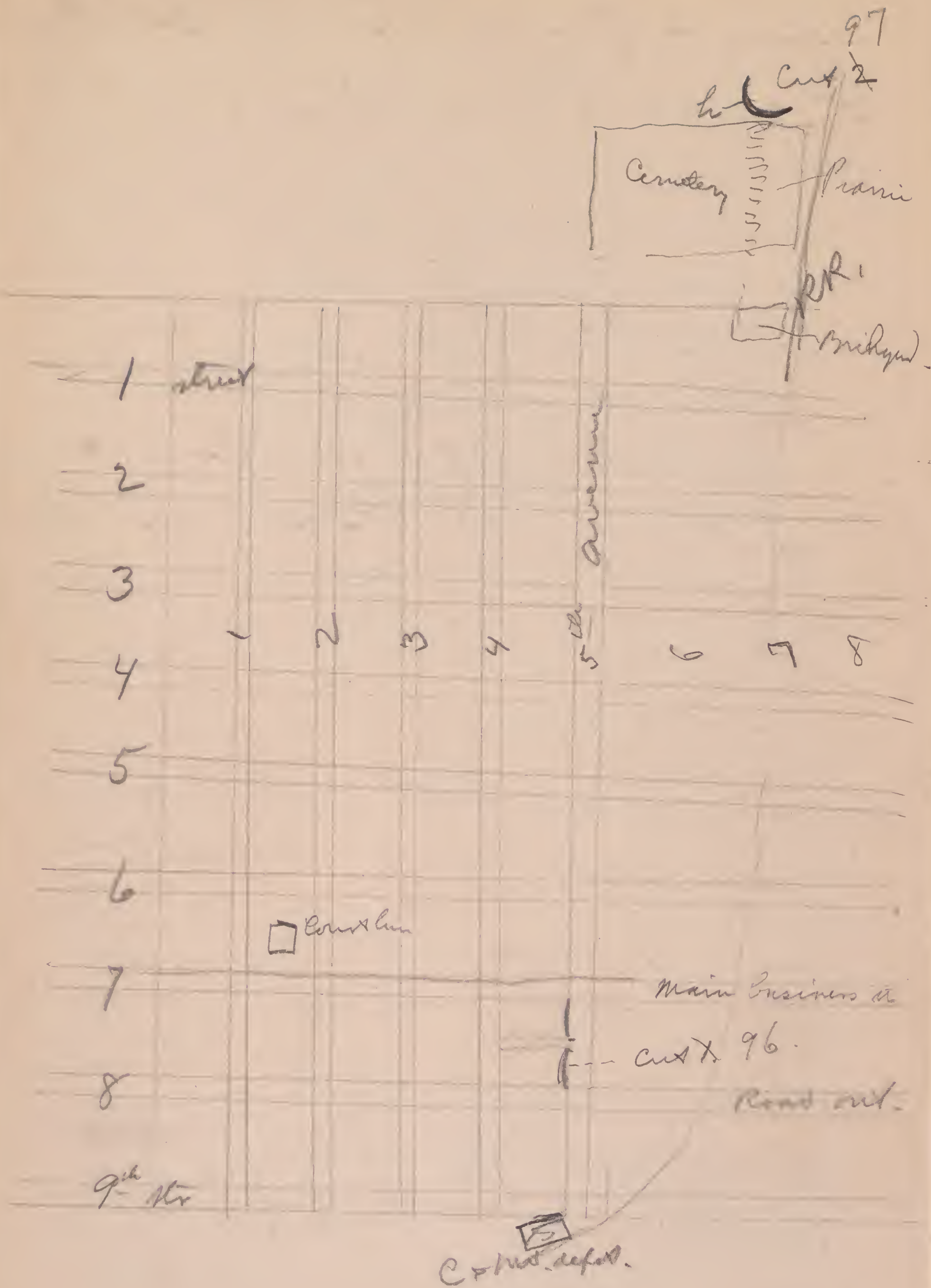
Datura latata not com.	Abutilon arvense not com.
Brassica nigra com.	Xanthoxylum not com.
Lactuca scariola com.	Melilotus alba not com.
Panicum crusgalli com.	Maranta arundinacea frequent
✓ Chenopodium hybridum com.	Asclepias syriaca com
" album 1/2 com.	Trifolium pratense com
✓ Cannabis sativa com	Setaria viridis 1/2 com.
✓ Ambrosia trifida 1/2 com	Hedge mustard 1/2 com.
✓ Iva xanthiifolia com	Sonchus (round leaf) frequent
✓ Polygonum orientale 1/2 com	Plantago major com
✓ " (large) com	Amaranthus retrofractus com
" pennsylvanicum com	" blitoides not com.
Leptilon canadense 1/2 com.	Dandelion com
Ambrosia artemisiifolia com.	Poa pratensis 1/2 com.
Lepidium virginicum com	Polygonum (large) com.

Panicum (slender grass) com,
" capillare not com.
Trifolium arvense 1/2 com.
Nepeta calamintha com.
Hordeum jubatum com.
Cenchrus tribuloides not com.
Euphorbia (purslane?) com.
Rumex crispus (not com)
Salsola tragus (not com)
Chenopodium lanceolatum (rare)

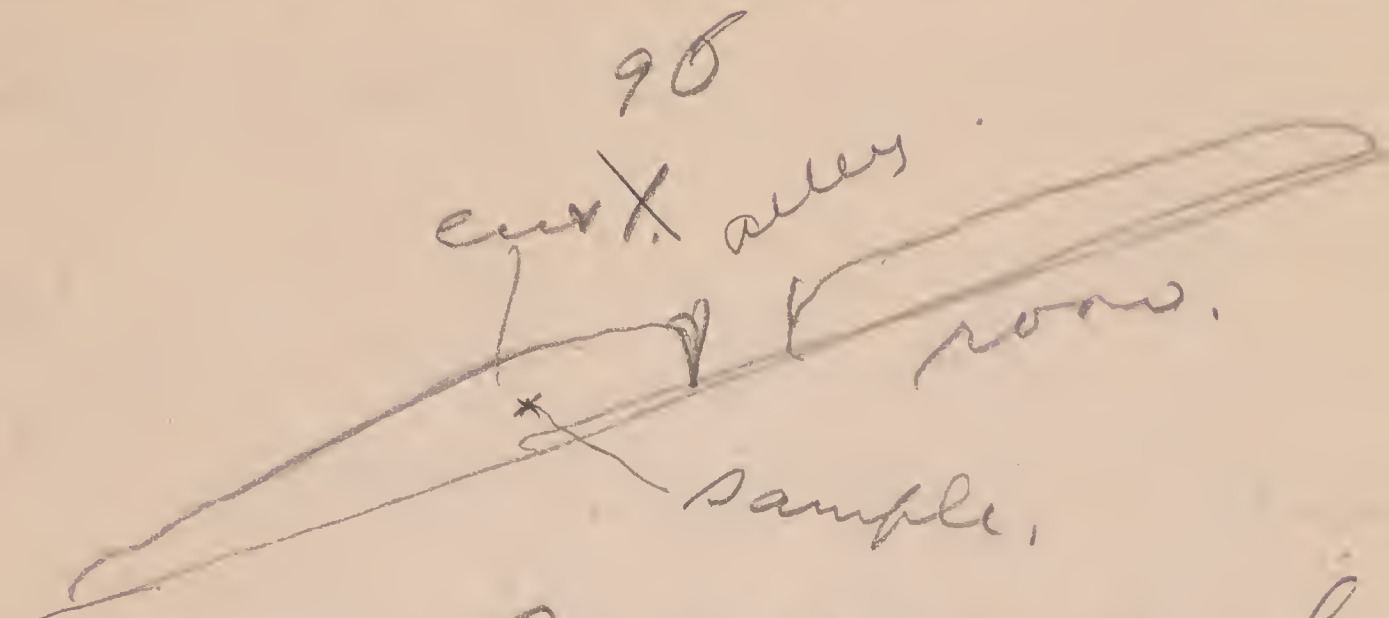
Also noticed the following cultivated
trees on streets & lawns:

Scotch Pine few
Box Elder 1/2 com.
Am. Elm com.
Green ash com.
Catalpa frequent
Pear some
Norway Spruce a few
Box Elder one
Box Elder com.
Soft Maple 1/2 com.
Plum 1/2 not seen
Apple.
Black cherry one.
Hard Maple (few)
Arbutus vitae few.

Later saw
Ginkgo tree



Going N. from depot, up a good sized hill, about $\frac{1}{2}$ way up, I found cut X,



This shows yellow loess, more or less reddish, loose & soft, with a few nodules, and quite a number of shells (see spec.).

Took a sample at x, where bank is about 7 ft. high, & x is about $3\frac{1}{2}$ ft. below surface.

Cut ⁹⁷ 2 is just N.E. of corner of cemetery, or N. of prairie slope, and is a curved bank of irregular height, made by excavation of clay for brick.

(This year they are making cement brick & blocks, & have not burned brick.)
The loess in cut ⁹⁷ 2 is brownish,

soft, friable, with few small nodules, and some fossils (see ref). Took sample 8 ft. below surface toward S.E. end.

Fossils are mostly from NW. end, but extends all along.

The bank is highest at h, & is here about 15 ft. high.

Aug, 13 (Thurs.)

19

Went out at 4:30 am. and set up pans, etc.

I. Evaporating pan no. 1, Piche no. 1,

~~the~~, windmill anemometer and cup evaporimeter no. 1. are on the bare slope facing west, and are about ⁵⁵60 feet

below top of reservoir hills, Or ^{140 ft.} above depot.

This is area 1 in my plant notes, see p. 31.

II. Evaporating pan 2, Piche 2, and cup evaporimeter 2, are set up just over the ridge east, at same height, in scant timber, but well sheltered. See p. 31.

The N.W. wind of today blows in here some (see record) ^{I & II are separated by "border strip" about 2 rods wide.}

This is area 2 in my plant notes.

III. On a point jutting out west, & lying S.W. of area 1, set up 1 evaporating pan, no. 3. This is about 170 ft. above depot, & faces south & west.

IV - Just over the ridge E, and
in a field which was formerly
timbered, set up evaporating
pan no. 4. at same altitude
as no. 3. (This is the "old 4".
at next reading I moved this
to a point at same elevation
in Tucker's orchard (few small
trees, - very poor in open) (see p.

There was quite a heavy dew in
the morning,

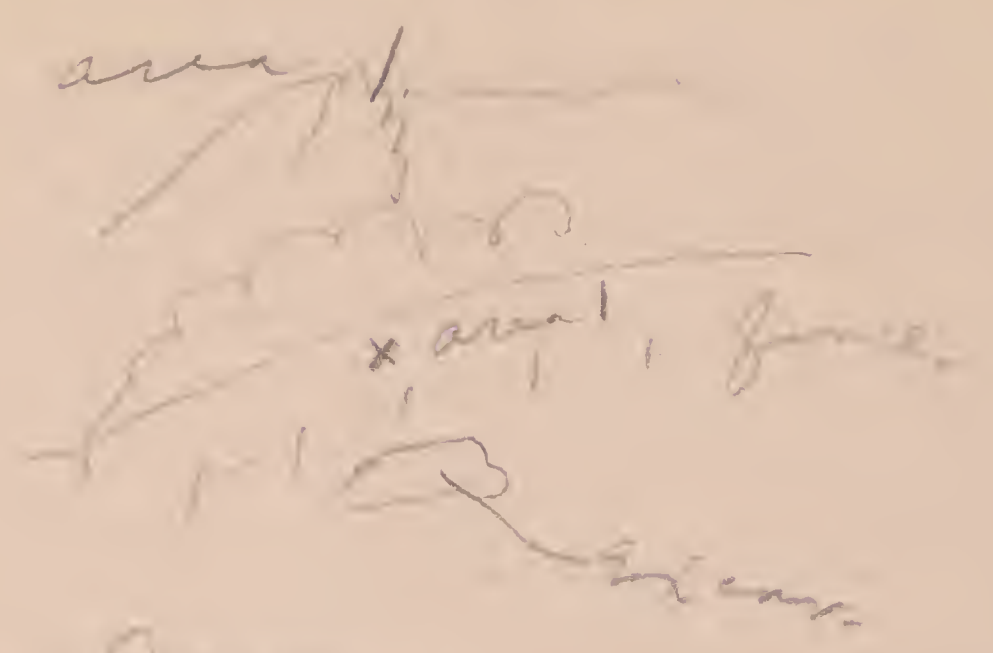
It should be remembered that
day before yesterday it rained
all day, & that yesterday
morning it was too wet to go
to the field!

Wind became strong enough to turn²¹
scup anemometer at 9.45 AM,
but it came in gusts, by fits &
starts.

Barometer

	1042
	1040
no. 3	1018
	1035
	1032
no. 4	1018
	1020
no. 4	1024
	1020
at 1	1500

- ✓ Photo 1- (Spire)
- ✓ " 2- Looking S. at area 1 - see summer
- ✓ " 5- Same.
- ✓ " 6- Looking N. from pt. to area 1.



- ✓ " 7- Same.
- ✓ " 8- Looking N.W. from same point, across valley, - or up valley.
- ✓ " 3 } Looking N.E. into &
- ✓ " 4 } along Schneider's hollow.

Aug. 13.

Wind

- ✓ { 1- 12³⁸ - 12⁴³ - 3270 - 500 - - NW
- ✓ { 2- 12³⁰ - 12³⁵ - 640 ft. "
- ✓ { 2- 12⁵⁴ - 12⁵⁹ - 428 ft. "
- ✓ { 1- 10²⁰ - 1⁰⁷ - 815 ft. "
- ✓ { 3- 2⁰⁵ - 2¹⁰ - 2036 ft - from west.
- ✓ { 4- 1⁵⁵ - 2⁰⁰ - 462 ft - from N.E. down hollow.

Took one reading with Simon's Psychrometer - at each of 4 places.

	dry	wet	at 2 PM
✓ { no. 1 -	83	71	
✓ { " 2 -	81	71	
✓ { " 3 -	84	71	
✓ { " 4 -	83 1/2	71.	
✓ { on top of ridge W. of 4	85.	71.	

✓ Wind mill at noon.
67.6, 2 miles.

26

At 5 PM. value of wind

no. 2. 4.45 - 4.53 - 190 ft

wind came from N. of the house

no. 1. 4.56 - 5.01 - 970 ft.

It is hazy now, and the wind is almost N. the day has been real bright at any time.

At 5 PM. Took Green's psychrom.

reading at:

1 - 84 1/2 73

2 - 79 71

3 - 84 1/2 72 1/2

4 - 81 71

Practically no wind.

Set of rods 81-71

At 7.30 PM. Green

1 72 69

2 - 73 69

3 - 75 68 - E. wind

4 - 75 68 - E. wind

27

The day was more or less hazy, especially afternoon and early in the morning. There was little wind, and that came mostly by fits, - first from NW, - then West, ^{Snyder's Hollow} brought some. It died down in latter part of afternoon, & during middle of P. M. the plants at the west border of area (2)

were wilted & drooping.

The woods are becoming (in area 2) become no leaf mulch & few small plants.

(Has this been fastured recently? - "L. - in recent years?

at about 7.45 PM. an East wind starts up, &

effect on psychrometer was noticeable.

Although not much wind
I could see some clouds
of dust in the Blair
Sundance Territory.

Found flint chip, pebbles
& fragments of clams
on top of ridge. I

could also make out at
least one mound. (See
plot.)

Readings of psychrometer taken
mostly about 1 ft. - or less -
Piche & were about 8 in.
cups - burins to Cook.

Pans on level of surface -
burins.

Pan II was probably a little fuller,
on account of wrong mark, perhaps
40 cc. should be added to reading.
At first reading of cup evap. I
found what appeared to be slight
leak - hence large reading. I stopped
it for next setting.

Aug. 14 - Friday.

Went out at 5:45 am. Was
cloudy, with wind from E., &
at first with occasional raindrops.
at 7:15 commenced rain hard -
got a good soaking on my
way back to hotel. There was no dew.

The specially noteworthy facts
to be taken in connection with
observations are as follows:

Pan 4 was quite exposed to the
damp E. wind, which evidently
blew all night.

Pan 3, though on west side, was
so situated on the S. side of a
projecting ridge that it caught
the wind much stronger than any
other pan.

No 1 Green reading was taken dry,
but it had commenced to
sprinkle before 2, 3, & 4 were taken.
I could not try actual psych. as
it was getting too much like rain.
all observations taken 7 to 1 1/2 feet
above surface (except pans), & cup

30 and Piche which were less than 1 ft.

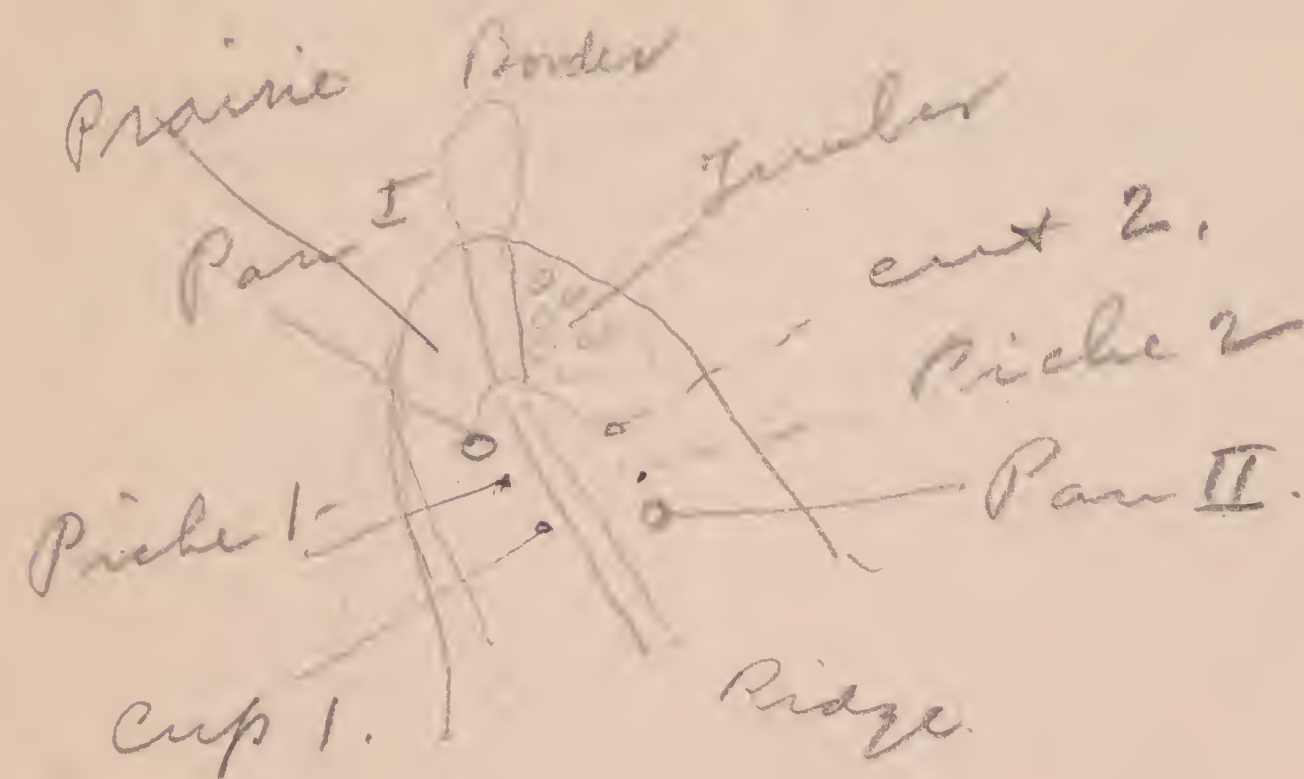
On the way up I took following
barometer readings:

walk in front of Miller Hotel -	0
to north on 5th	12(15)
Street at foot of hill	
Superior st (1st bluff)	55
E. Michigan (2nd ")	90
W. Clair st	175 120
Lincoln (a little S. of street)	190
(about 2 blocks)	
1 blk. west -	175 180
1 " north -	185 190
1 " W. west - (top of rise)	195
1 " N. = end of str.	

I also located instruments:

No. 1 Piche is 7 ft. S of pan I +
on same "cat-step". No. 1.
cup evaporimeter is 10 ft. 10 in
farther S, - the line of
instruments showing a little
to southeast.

No. 2 Piche is 6 ft. 8 in. W. ³¹
of pan. II. Cup 2 is 10 ft.
4 in. W. of pan II



It is 20 ft. (around on curve at
level) to W. edge of border.

The border (mixed prairie &
forest) is about 25 ft. wide.

Pan II is back E. 48 ft.
from E. side of border area.
This is all on a level.

Really the ridge between ^{Pan I &}
II is scarcely elevated above
Pan II, but latter is
"around the corner."

Rained, and I got a good wetting.
Went to Logan and worked at
Court House. In evening went out
to old quarry, and noted additional
trees on flat: *Gymnocladus*, Black willow,
Am. elm. Returned to Mo. Valley
at 10:30 PM.

Aug. 15 - (Saturday)

Rained in morning. Pruned plants
& wrote.

In afternoon went on hill. Again
took barometer readings

Walk at Miller Hotel (= chm. depot)	0
2 nd blk north - (Foot of hill)	15
Superior str (1 st shelf)	55
(2 nd ")	90

Top of log creek str	118
quartzite = 185	145
2 nd dip str 166	175
Mass of fossils - 76	185
Shale (S. Howard)	168
1 st dip str 148	178
at base str 110	188
at base - 15	

Visited Smith's Brickyard lot, &
found two loams - Reserved for
fuller examination.
Saw nice lot of prairie plants.
Get later.

Interviewed Mr. A.H. Sniff, editor of
the Daily News.

Sunday, Aug. 16.

Rained A.M. Packed plants,
wrote letters, & at 11³⁰ left for
Ormaiztegui. (Shipped parcel of plants)
Went to Bruch's, - from Vaster
had gone to Chicago.

In the afternoon went out
with Currier to station a 4 of
a mile above water works at Flores,
& fixed station on ridge, 100
ft. (barom.) above road, & at
edge of clearing, - only scantily
shaded by border trees.

This is at Mr. _____
bungalow. He is a member of
library board with Frank Baker.
at first skeptical & intrusive, but
on learning object of visit, was very
kind.

The bluff here faces a little
S. E., & is heavily wooded, but
there is a clearing near top, & at
N.W. corner of this I set up
cup & Piche evaporimeter.

Very hot.
 Harris & Fairmount Park, &
 above (alt.) of 10th Ave. entrance,
 at 100 ft. alt. I set up
 instruments (Bar & Temp scop.),
 & took readings, (see sheet).
 Returned to Burdette in
 evening.

Monday, Aug. 17,

It was stormy & threatening
 all night, but no rain.
 Night was very sultry, but
 toward morning ~~the~~ good
 N.W. wind set in. At
 11 AM. midnight it was cloudy, &
 remained so until morning.
 (Took readings, see sheet.)
 I changed the station to the
 same level on next ridge
 north, opposite middle between
 8th & 9th Aves. This project
 not mine, & is the best exposed

point in easy reach.
 I noticed that instruments set
 up last night were under a
 little bank, - hence, cut off
 from northerly wind.
 Evaporation was slight. There
 was very little dew, - almost
 none, except in lower places.
 My new station is on top of
 spur, exposed to both wind & sun.
 It is 140 ft. above flat, but
 100 ft. above shelf on which
 are trees, residences, etc.
 common, this being farther
 down stream should be a
 little higher.
 The new station is 70 ft. higher,
 at top of ridge of which the old
 main station is a spur.
 The 3rd station is just over the
 ridge (East) 2 rods from top, and 6 ft.
 below it. Scant timber here.
 The 4th station is at top of main ridge
 at angle of road in N.W. cor. of the Park
 & is 25 ft. above No. 3, or 205 ft. above
 flat.

ropes - W. side (top) of Fairmont Park bluffs

Melilotus virginicus
Aureola canescens
Petalostemum candidum
 " *violaceum*
Cornus canadensis
Sassa (bealensis)
Ceanothus -
Liatris squarrosa
 (spicata?)
Lygodesmia juncea
Andropogon furcata
Grass (slump - see
 next valley)
Elymus (big one)
Melilotus alba
Solidago " *laevigata*
Bouteloua racemosa
Galium boreale
Aster (small blue)
 " *diversifolius*
 " *multiflorus*
Salix humilis
Quercus macrocarpa
Platanus glabra
Comandra virginica
Verbena stricta
Eriogonum
Asplenium canadense
Aster divinus

Solidago smooth ^{see}
 " rough ^{see Valley}
Astragalus (gray, hairy)
 " ^{smooth -}
 (caricature?)
Castilleja occidentalis
Euphorbia marginata
 " *corollata*
 " *missouriensis* (see Valley)
Parthenocissus
Setaria verticillata
Onoclea -
Ambrosia -
Veronica racemosa
Asclepias verticillata
Rubus eupatorioides
Rosa - (see Valley)
Populus
Collinsia
Arenaria repens
Muhlenbergia (calligera)
Desmodium canadense
Lupinus *capensis*
 (but mostly white)
Chrysopsis -
 add *Cypripedium*
~~*Phlox pilularis*~~
~~*Erigeron*~~

40. Readings at pts. indicated, -
 in Fairmount Park - Green's Psych.

Hour	70 ²	75 ²	3	4	6
	70 ² H	75 ² H	In woods	In woods	over ridge
	above station	above station	2 rods E	150 ft. E.	E. + W. in
	dry wet	dry wet	dry wet	dry wet	dry wet
8.40	71 62	74 64	70 61	69 1/2 61 1/2	
9.	71 62	72 62			
10	78 67	76 64	73 64	73 61	
11	80 66	80 65	78 64	76 63	
12	81 66	81 66	76 66	74 66	78 66
	(at 12.20) (at 1.30-67)				
1	82 68	82 66	78 63	76 61	80 67
2	82 66	85 70	78 63	76 62	82 67
3	79 66	77 66	76 64	75 62	76 65
4	76 65	77 68	76 64	74 64	78 67
5	76 66	79 67	75 64	74 64	78 67
6	77 68	75 64	74 64	74 63	75 1/2 64
7	70 62	70 62	71 62	71 1/2 62	71 62

at 10²⁶ - 10³¹ - Rel. from 11 80 ft.
 at station 6 ft. below top, E. of ridge
 in woods -

at 12⁰ - 6¹ - 1850 same station

at lower station (in woods) 1665 - 12¹⁴ - 12¹⁹

Very top of ridge above station, 41
 wind swept, was 77-67 at 1.30

Stratford of bluff
 1 block W. of
 entrance to
 Fairmount



at 12³⁰ (when sky was cloudy), I

held my green in wind &

it read 78 - 63

I then turned & put page.

in station of my body & at once
wet bulb went to 65.

78 - 65 was reading

at station 5 - velocity

2²² - 2²⁷ = 510 ft.

Mostly weather leaves.

✓ Photo 9 - looking N. across
reservoir - Council Bluffs

✓ Photo 10 - Looking S. into
Fairmount Park,
Northwestern timberland
view

✓ Photo 11 Look E. of S. from main
station.

✓ Photo 12 - looking N. of S. at
sunrise pocket.

Aug. 17, 1908

✓ Photo 13 & 14

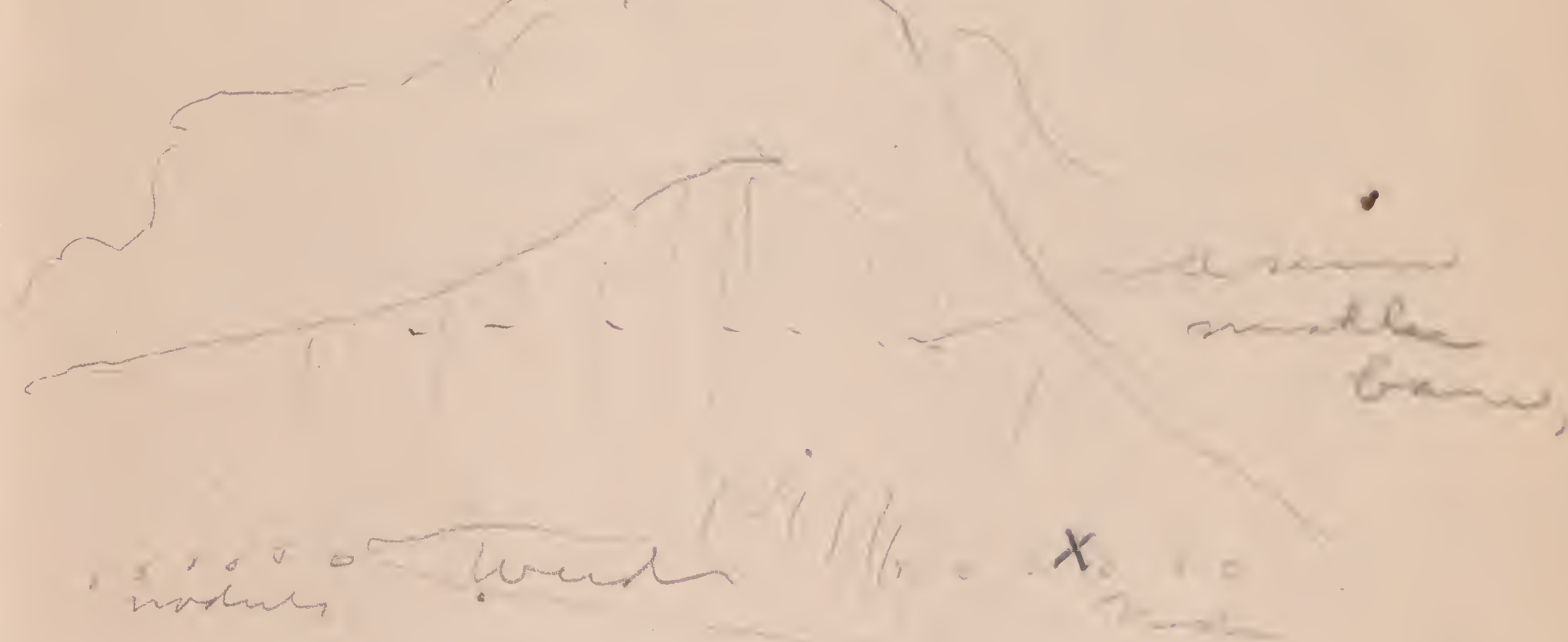
cut at end of station ridge

on 9th Ave.

strong band of large nodules

✓ Photo 15 & 16 -

looking N. at cut -



✓ 17 & 18

near view of nodules

at X

Not wind enough to
move the leaves at
no. 3, also 2, though
latter gets little gusts.

In the cut just below my
station the band of nodules is
very prominent & follows somewhat
the vertical contour, dipping
towards west.

Above this, near top of cut, is
the very distinct shell band,
which is also exposed along
the sides of the ridge. Shells
are exceedingly abundant (see box).

The nodule layer contains the
largest nodules that I have seen.
Spent night at Ponce de Leon.

Aug. 18, Tuesday.

Left Council Bluffs at 7.⁵⁰
am. for Winona Valley.

46

Time went by ^{the} Claude Cox.

Pit on W. side.

Just across road (about 300
yds S. of E. of pit.) is house
where well shows.

40. { Black soil 2 or 3 ft.
Blue joint clay
- 87 { Sand with (pebbles) of little
Sand
Gravel

Total depth 87
water in gravel.

The bones are all in gravel,
also from fragments of wood
in same gravel.

The well is 55 ft. above
the shelf on which house
was built.

This on farm of P. R. Cox,
father of Claude Cox.

Pit (McGowan) - S. of 47

W. valley is 22 ft.

above bottom (see cut
P.R. is 6 ft.
above bottom.)

Pit shows sand & gravel
mostly sand, with pebbles
in bands & below



Copper above with clay.
Like stuff, as in box pit.
No bones.

cut 18 ft. higher,

44 Aug. 19, Wed.

In AM. packed and looked up notes.

In afternoon took barometric readings on the east ridge and E. side of middle ridge, they checked perfectly

on the return, and I let them stand. Also checked with other readings on 5th St. See map

of town for these. I used the walk in front of the Miller Hotel as a datum line.

This is really same as C. & N.W. depot.

I also located east ridge and east line of middle ridge. The unusual number of cuts in Mo. Valley makes this a fine find.

Thurs.
~~Wed.~~ Aug. 20

49

went S.E. with Linné Plumb.
Stopped at gravel pit (Cox's) + got a piece of clam + bone.
Visited the ^{Wicks} 'Ditch' pit just S. of road, but found it slumped. Report has it that many bones were also found here.

Cut 67 is a low cut (with gutter only 4-6 ft. high + below upper 2-4 ft. (which is gravel, but without iron tubes + contain fine lime nodules) the loam is more compact, bluish, with iron streaks + with few nodules + a few very fragile shells. Recognized *Helicium venustum* + fragments of *Succinea*. (see box)

Took a few nodules + samples of clay about 5 ft. from top.

No. 68 is a similar exposure with small fragments of shells, but is a little yellower.

It is not over 6 ft. deep + rather long, on N.E. side of road.

5 The road here gradually runs
up slope, so that 68 is higher
than 67.

Cut 69 is on hill sloping up S.E.

a) - upper 3-5 feet, which is
yellow, crumbly, & with many
little nodules. Also a few
large *Succinea* etc. (see spec.)
also sample & nodules.
Sample 3 ft. from top

b) the lower bodies of loess. It is
chiefly yellow, but in places is
bluish with iron streaks &
chocolate brown spots.

It has fossils scattered all
through & also a limited
quantity of rounded nodules.
See shells, nodules & samples.
Sample 6 ft. from top, about
where fossils are most
abundant.

The total depth of cut is
about 10 ft. & nearly
three telephone lengths long.

Cut 70 - is similar, but only
about 6 ft. deep, no shells,

51
Cut 71 is in little hollow at corner
(nw.) about 8 ft. of compact
loess with red streaks & bones
(like samples from cut 69b)
is exposed in a bank & road cut
on W. side of road.

In little gutter on W. side
a blue loam with white limy
tubes & red soil tubes in
exposure (see sample 71b)
A little cut (not deep but long)
leading up first hill E. shows
blue loam & tubes at foot of hill &
in it is soil at foot & then
nodulose. The layer of loam above.
I could not make out line
here, but 69b seems to
be a transition loam, or
it is upper member of post
Kansan.

no. 72 is at foot of hill (its E. end)
where about 6 ft of yellow
loam & the = of 69 a. overlying
a more compact blue loam,
with a dark chocolate iron
band, interrupted & irregular,
& only an inch or so thick.

no. 73 is a deep road cut,
15 ft. deep, being cut
across a narrow ridge.
The lower mass of loam is
bluish gray, with few nodules
& some bones scattered all
through. see sample 73 b.)
It is brown light, with chocolate
spots & a few iron streaks -
inclined to a yellowish &
is not typical blue loam.

The upper layer of 3-5 ft
is crumbly, reddish, & shades
into 73 b. Few small

nodules when in water must
no. 74 is ~~near~~ foot of hill just
E. of 73 & is a washout N. of
road about 12 ft. deep.
It shows in lower half a
very compact loam (see sample
74) & this is streaked with
iron & chocolate.

This is Prather's

On road -
(In sec. 20 at Magnolia)

dry well black soil.
2 ft black soil.
20 yellow clay.
40 blue clay
10 ft. sandy - & dark
blue clay -
well 70 ft. deep.
at 40 ft. a reap. & then
dry to 70 ft. -

A little better N. about 2 to
30 ft. on west side.

2 ft black soil
20 yellow clay
40 blue clay
Hard pan. - 30 ft
below & same.

54 In Kansas boulders as big
as your head. Black
niggerhead & some red ones.

Looking E. from Beebetown
I could see rolling plain,
not so rough east of Potato
creek, & we could look probably
9 or 10 miles or more.

It is more gently rolling
Kansas plain, evidently
all loess covered.

Between Beebetown & E. side
of Potato creek the timber is
broken.

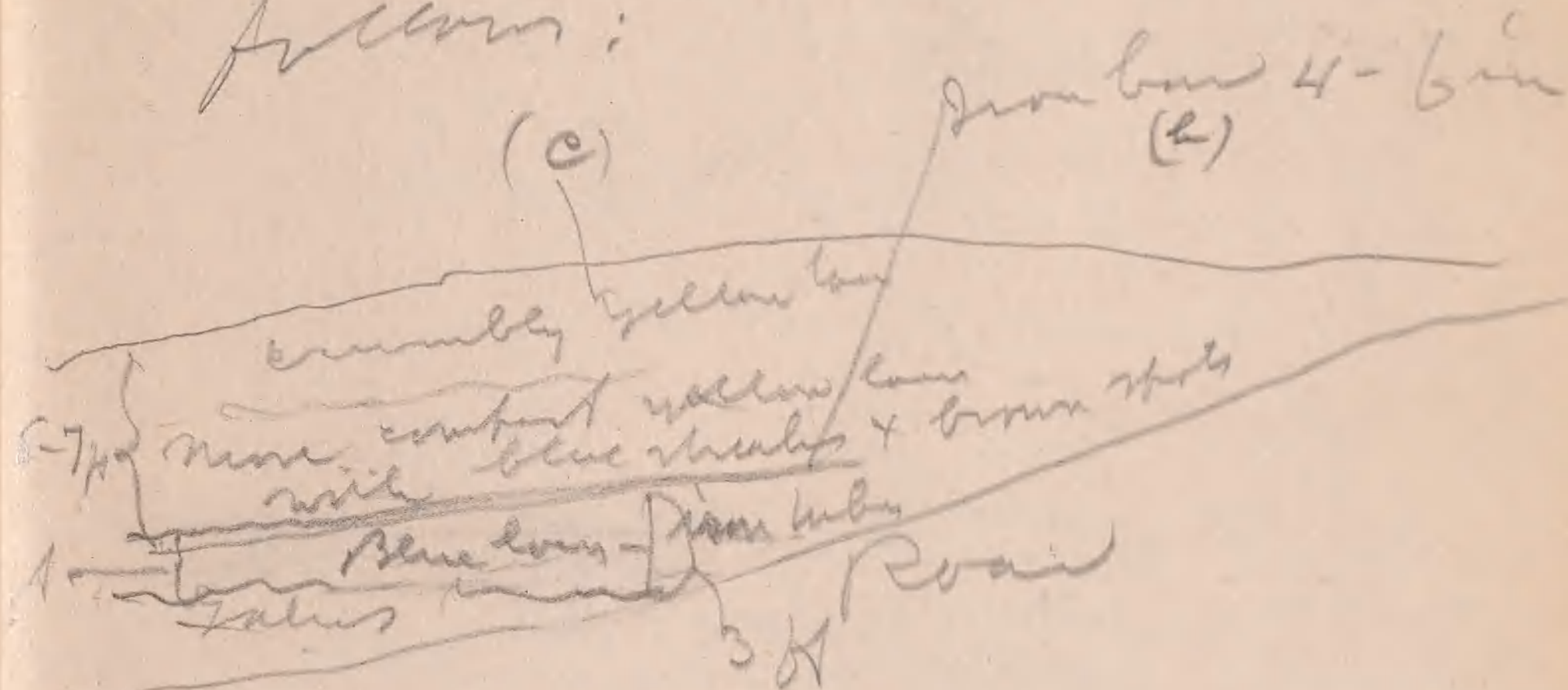
S.W. part of county is rough-
rolling Kansan right up to
the bluff country.

The Potato creek valley
makes a little break, but
it is not a broad valley.
Has very little timber.

55 skirting it in tufts,
just E. of Beebetown on N. side
of road is quite a catalpa
grove.

At ~~cut~~ 75 Blue loess with numerous
tubules shown in cut made
at entrance to farmyard.

Cut 76 is near base of little slope
& extends to top of little ridge N.
At base of slope it is as
follows:



The blue loess (a) is compact,
with white calcareous patches &
small nodules.

The upper loess is also compact
but is of mottled yellow & gray
type seen in 73. (See samples

At 77 the road after passing
down great deep hill,
passes over a small hill just
S. of creek, & then in road, on
down slope (toward 4) there is
a considerable amount of Kewanee
loam exposed. (See pebbles.)

cut 78 is on ^{N.} slope, leading
down from top of first ridge
N. of creek.

It is 4-6 ft deep &
the lower part is grayish
like cut 73, & upper
part crumbly yellow, with
small nodules, as before.

But fossils from lower
part of crumbly layer &
part in which it blends with
lower layer. (See box)

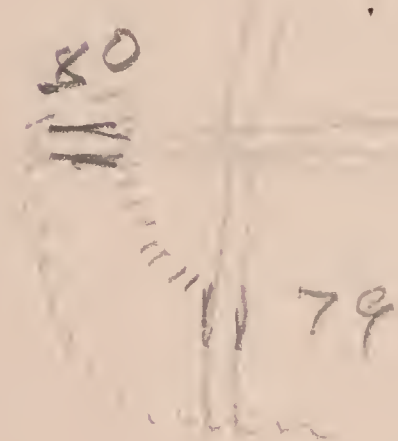
cut 79

This is on top & N. slope of
first hill before town.

It reaches 7 ft in depth &
is just like 78 - fossils
are in lower part of upper &
upper part of lower.

Lower has rounded nodules
as before. Upper, small ones
as before.

cut 80 same same more



12 ft. deep - same as 73
Fossils from lower part.
Rounded nodules below (few)
Small one above (few).

cut 81 - in on first section small
slope E. of creek. It shows
however one blue-black over 1 ft.
in diam + plane, & smaller
pebbles, etc. of the Kansan bed.
Part way up the slope a red
ferret zone shows, - ends up
into a reddish clay. ^(covered) All
Kansan drift. On top there
is loess over all.

cut 82 - Show blue loess
with irregular iron
streaks and bands in upper
part, & yellow loess (a little)
above

Near this found living
shells in wood.

cut 83 - Show blue loess below,
yellow above -
fragments of shells
low nodules
down near creek.

cut 84 on slope facing W.
Like other - yellow, small
nodules above,
larger rounded nodules in
lower more compact part

cut 85 is on slope facing E. & reaches to
top of hill
Gravelly; but 8 ft deep
saw few fragments of shells
also took few from compact
lower part on lower half
of slope

The topography of territory S.
& S.E. & E. of Mo. Valley is
good Kansan.
S.E. of Mo. Valley is rougher
towns bluffs, and E. & NE.
from Beebetown, where I came
six for miles it is somewhat
more gently rolling Kansan (a
fine view for 8-10^{mi} miles), broken
by the rather narrow valley of
Potato creek, along the benches &
which are lines of clumps &
trees.

60
Trunks of some size (now interrupted
by clearing) occur in sec. 14, 24 & 25

7. 78. R. 44 & 19 R. 43

N. of Beulah in sec. 14, 11, 1, 2, etc.

The topography is very rough,
especially along Harris Grove Creek,
and there is considerable amount
of heavy timber. In places, especially
5 - toward border, even quite deep
woods are due from underneath
& leaf-moulded, - a peculiar condition
described also at sta. 1, Mo. Valley,
(see pp. 61 & 62)

There is, however, characteristic
deciduous woods near the creek.

Aug. 21 - Friday.

61

The day was hazy & cloudy
with thin clouds so that a
slight shadow was thrown on
part of the time. Only occasionally
did the sun break out.

At stations 2 & 4 there
was very little wind, mostly
puffs.

There was a rather heavy
dew in the morning.

The deeper woods are bare
like those on yesterday's
trip. A few small scattered
timber plants, looking like
redwing oaks, I could
recognize among them:

{ Eupatorium agerifolius
Chenopodium album?
Viola cucullata
Symphytum
Young elms, etc.
ambrosia trifida
Lactuca - ?

See p. 25

62 There bare woods run to
after where the wind
enters.
The trees are there already
enumerated.

Add butler ^{walnut} & tree ²

I took photos of these
bare grown woods.

Nov. 19, 20 & 20 & 27.

Each pair represents a
different view.

Aug. 22 - 1908 Sat. 63

Packed & arranged material
At 2²⁵ left for Omaha
and Humboldt.
Wind Northerly & cold in
morning. (Gathered up
apparatus am. temp.
53° F.)

Aug. 23 - Sunday

Rained all am. Cloudy
PM.

Spoke at 3 pm with
young people.

Mrs. Koton is a moving
spirit. Young Bohm

Krasny, the president, is OK.

Fr. Krasny gave me name of
John Kudrle ^{W. 4th} —
Jos. Vavich
1407 Center st

Aug. 24. Monday

Spent day at Oklahe.
 Got my permit from US & BLM
 to dig for Bison bones &
 bank & conduct locate that
 on account of weather. Will
 get flat.

Drizzly rain most of PM. Warm
 Some morning glories (cult.) as thick as
 a comb in 5 & 6 on E.
 of Mesquite. That they were a
 dangerous weed.

✓ Photo 23-24 - Looking up
 Soldier river from bank
 from bridge on S. end of
 MC 24 -

✓ Photo 25-26 Looking up the river
 from bar N. of Mesquite (in valley)
 25 Snap. 26 Snap

✓ Photo 27-28. 27 Snap

Thompson small Salix fluvialis
 between 12 & 13 on N. side Mesquite in drift
 below 30 ft of loess.

Mr. R. L. Huntley chief w. P. R. B.
 Geo. Holdrege 13 & m.

Aug. 25 1988 Tuesday

Cloudy - S. wind.
 Drove out to Mesquite, the
 plants on bottomland same
 as those on dry hills.

~~#~~ ~~Carya chrysocarpa~~
~~#~~ ~~Euphorbia marginata~~
~~Quercus bicolor~~
~~Asclepias verticillata~~
~~Petalostemon~~
~~artemisia graphulata~~
~~Lespedeza capitata~~
~~Stemodia~~
~~Verbena stricta~~
~~Andropogon furcatus~~

64

Aug. 26 - Wednesday

J. C. Prather - well down
struck rock at Little River
S. of town - 1 mi. - No sand
3 tests - 135-137 ft. - Rock
very hard (not limestone)
about 2 miles N. of valley
well 192 ft. - nearly all
clay.

At Ferguson - cross of
Angels' Hollow
196 ft. sand - 4 trips
of sand & clay to 210.
Begin to get pebbles N
in hills at 150-175

At Mr. M. Cox's E. in
valley on E. slope
324 - common - 144 ft
Ledge of rock - lime stone
little iron - seem to be
Rock on about 300 ft in ledge
3 to 9 ft

at farm house
at 180 about three feet of 69
coal

1st ledge of coal
at 180 - about 3 ft.

2nd at 280
about 3 ft
soft coal,

No slate above or
below first ledge.
But 2nd ledge shale
about below. (some iron)

144 ft
surface

Ledge of about 6 ft.
Saw about 3 inches -
Ledge of rock

Several ledges
about 1/2 day & a rock
to 324 ft. - (like
then clay is red - like
ferrous oxide)

Thin
bed
36 ft

streak reddish layer (fossils
at 140-150 ft.)

one M. side of Boyer there
in sand below, but no gravel.

Peter Cox's well (at gravel
flat)

upper clay - 70-72 ft

dry sand - 35 ft. before
water was reached.

4-5 of Pebleton

Handspan - 50-60 ft to
handspan, & then gravel.

Notes in tubular wells -

S. of valley - just before
getting to Calloway - E. side

On shelf -
went 90 ft -

Gravel handspan at
35-40 ft. mostly
blue -

M. about Calloway 1 1/2 mi.
on shelf - Sandstone
20 ft of sand, then 40 or 50 ft
Red blue clay. Sandstone

a little thick & coal -
1/2 in thick -

2 mi W. of Logan

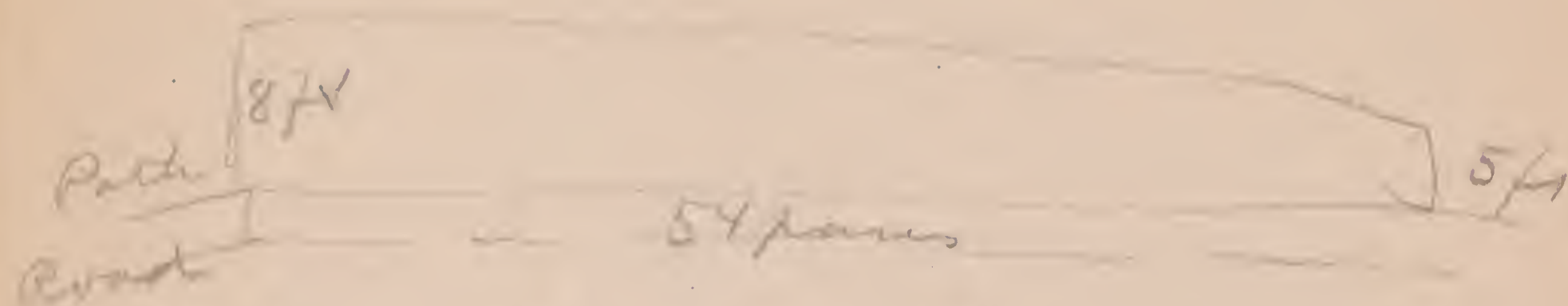
E. B. Vaughan's place -

about 200 ft -

No rock layers -

Yellow clay 170 ft of the

cut 1



The upper 4-5 ft is crumbly
yellow loam, with numerous

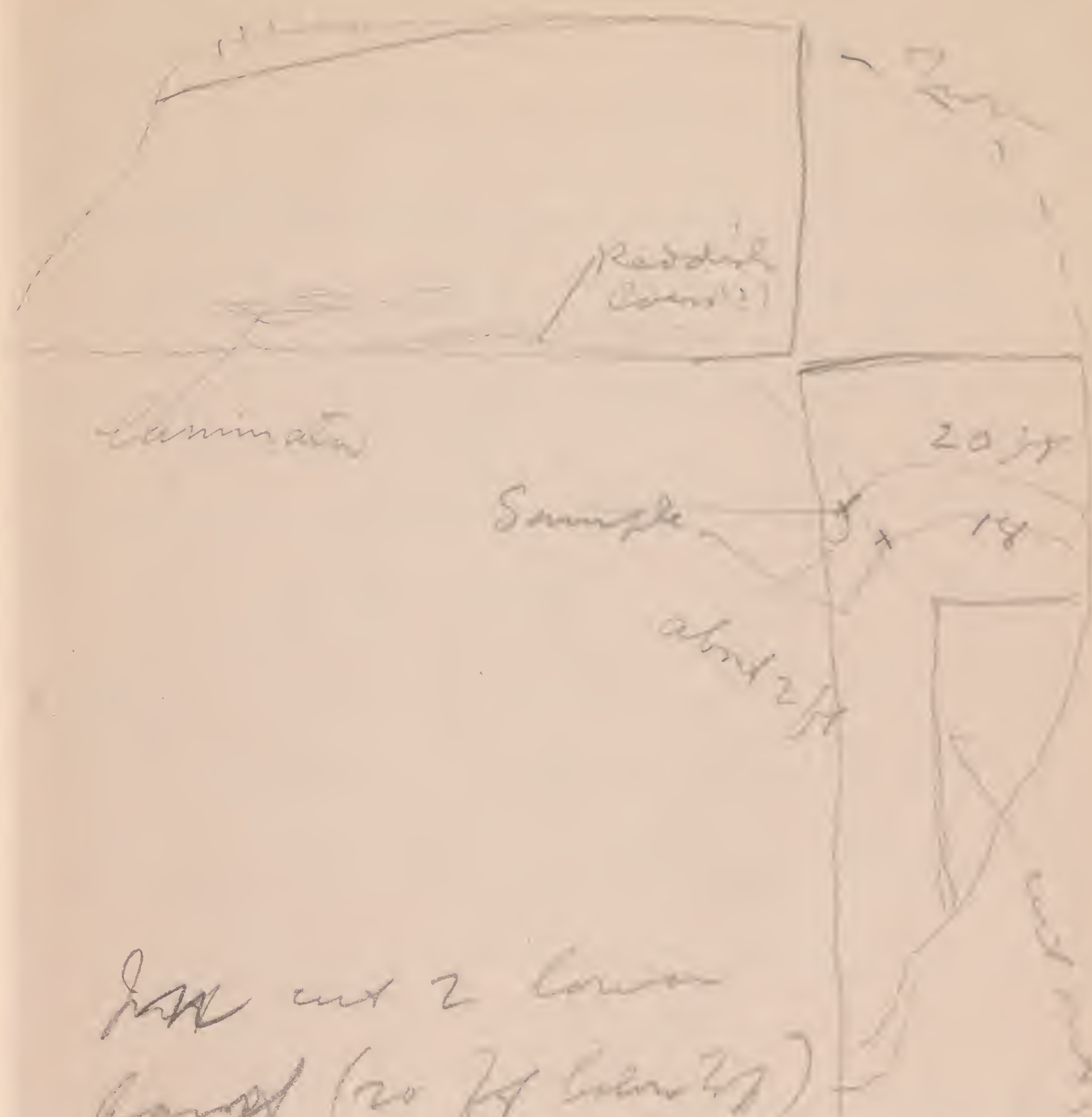
small, irregular nodules.
Took sample at 3 ft.

The nodules are fewer and
more rounded in the lower
more compact layer.

Took sample at 6 ft.

Both parts frequently show
lines & flakes of white lime
carbonate.

Saw only a few shells & these
are probably overwash from
~~brushy~~ brushy slope above.



Just cut 2 lower
part (20 ft below?)

is a soft yellow loam with
brown spots, a few horizontal
iron streaks & clonings, &
it shows a distinct horizontal
cleavage (channeling).

Nodules are practically absent
from lower part.

Upper layers as in (1)

at 18 ft & upward more
fine (either dried, or lower
part and stumps)

This contains scattered fossils
more compact than at 20

On W. side width 2 or 3 ft

of low loess becomes redder
with iron. It is distinctly
laminated (with iron streaks)

in part so marked, which is
between upper yellow &

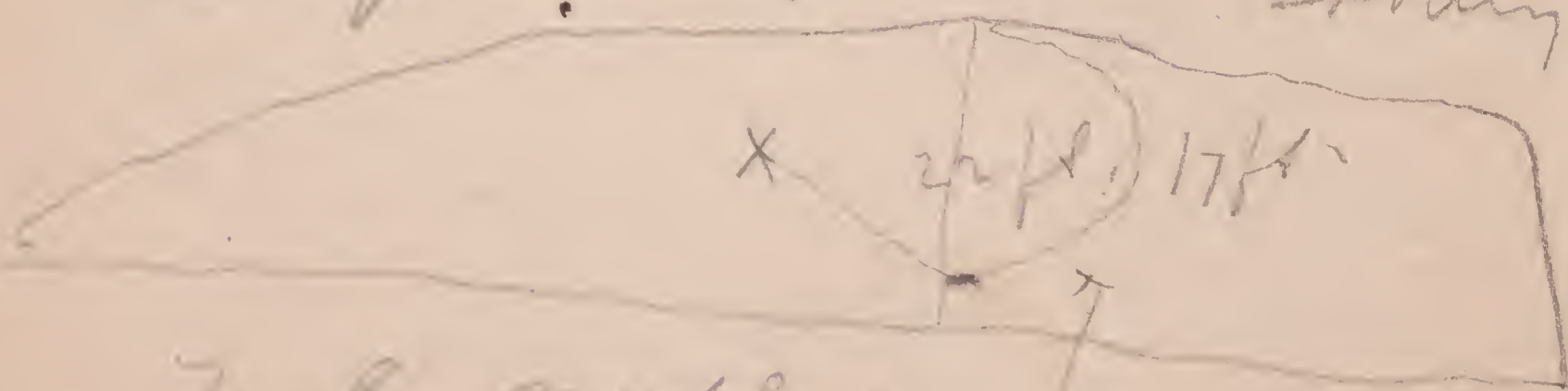
lower redder loess. (Transition)

See sample of reddish loess.

Is this redder only because wetter?

Compare when dry.

Cut 3 - over 1/2 blk long - about
22 ft deep. Looking S



Took sample at
20 ft from top.

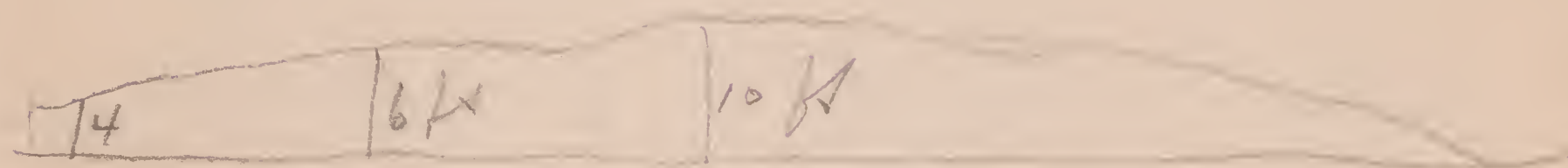
Fossils in cut 3 - (mine) taken 407 ft from
bottom of cut.

This is again yellow, fairly
laminated in fracture, with
very few round nodules

scattered fossils at x a
layer of broken shells - fragments, 5 in
long & 1/2 wide. Made out only from
this did not go in over
3 in. deep.

Cut 4

Looking N.



This is yellow loess, same as
in (3) & contains fossils &
a few nodules. Same defect,

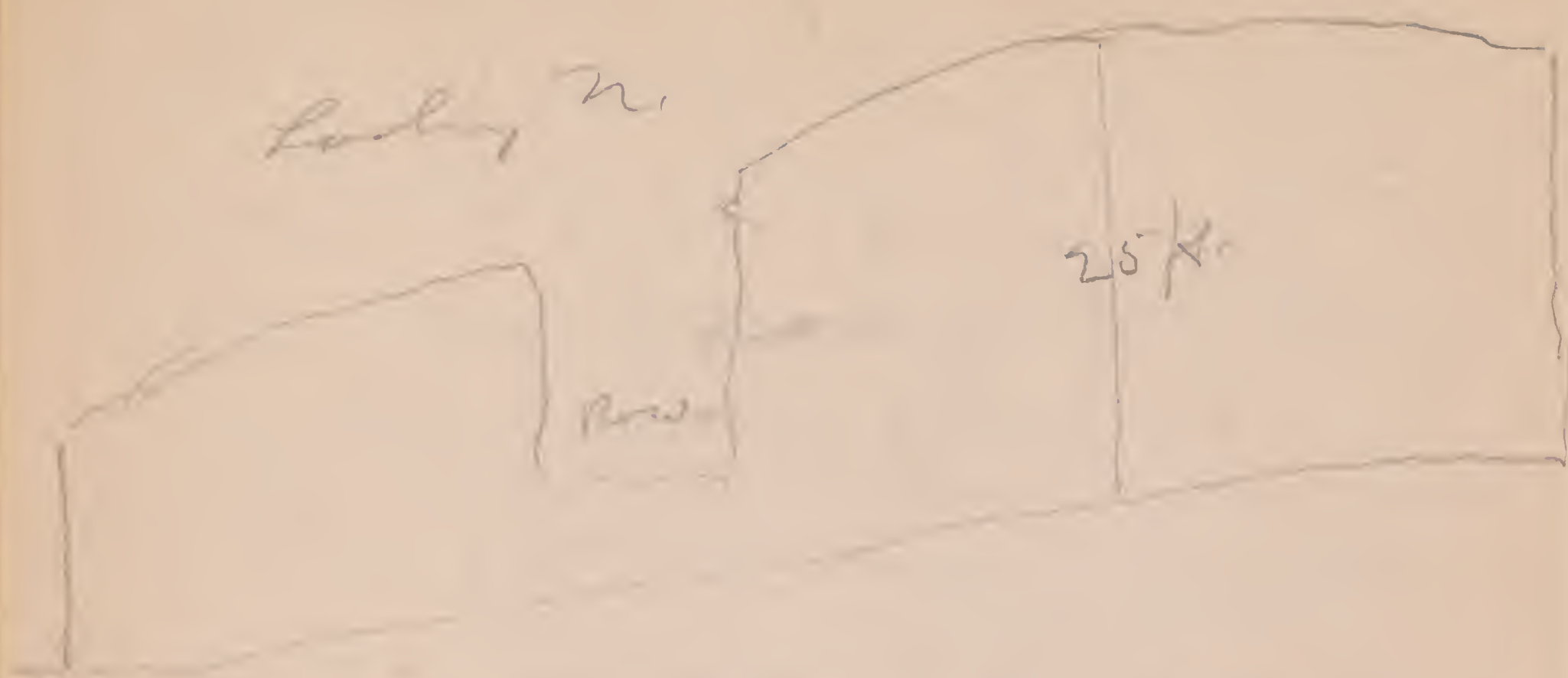
of course.
Cuts 3 & 4 show little if possibly
nodular layer above.

Nodules in both 3 & 4 (4 in
2) are either rounded or
bone-like, always smooth

In these & other cuts. Since
oblique is often found near
top of exposure & is often only
found found in that part.

76

cut 5 - Part facing S



The lower nodules are
same as in cut 3

Fossils are mostly just out of reach
in highest part, & I have to get
them on the road cut & around
the turn on N. side.

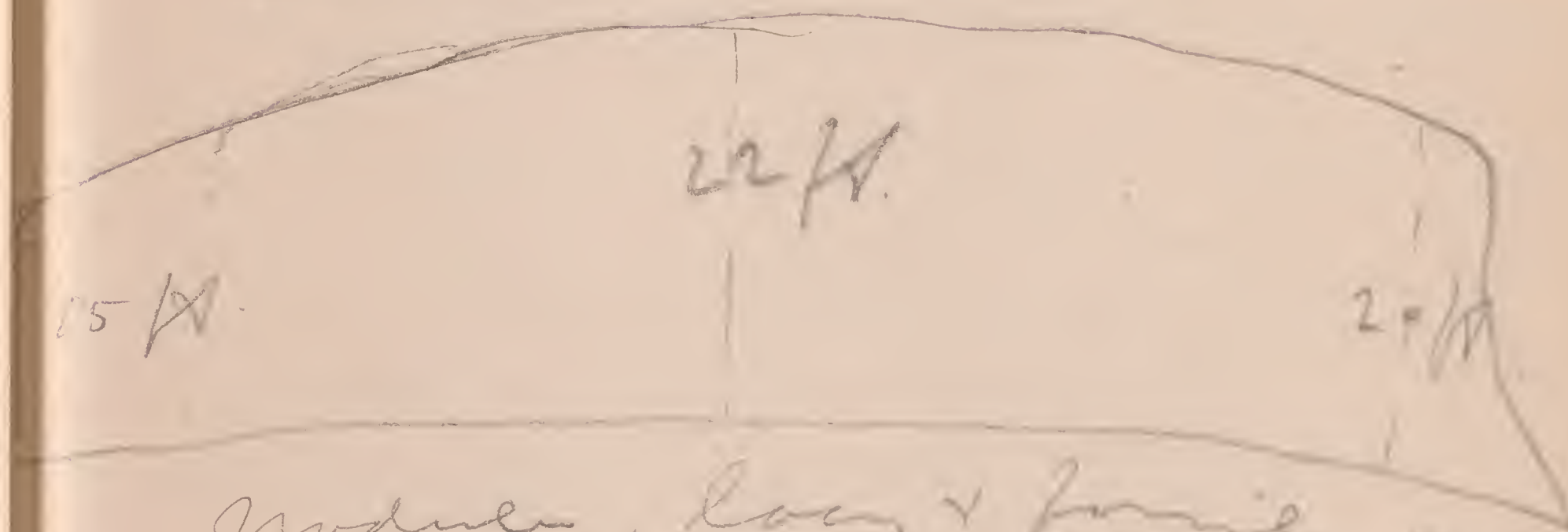
Fossils scattered, & not common.

All that part of cut 5 in E &
N. part (in lot) seems to be
same, & not so deep as cut 5
facing S. - about 15 ft perhaps
is highest of this part.

77

cut 6 is on slope &
at deepest pt. probably
18 ft. high. Gutter is
washed deep at base all
along & I could not work
much of it. Yellow loam
as in 5, nodules, fossils same
in places, especially below,
if shown distinct lamination
parallel to surface &
weathers uneven.

Cut 7 - Block long.



Nodules, loam, & fossils as
in 5 - mostly fossils
just out of reach, but
fossils few.

Cuts 7 & 8 have many
bank swallow holes - in upper
1/3 or so -

Cut 8

Like cut 7 - about 20 ft deep

few fossils, & mostly above. Nodules, lamination, color, texture, as before.

All brown.



Cut 9 is more

or less slumped, but shows same materials as 7 & 8, only upper nodular layer is a little more distinct.

Lower, nodules, fossils same.

The fossils from bands & streaks shown in place (shown in place). Its upper end (N) is lower

& more slumped.



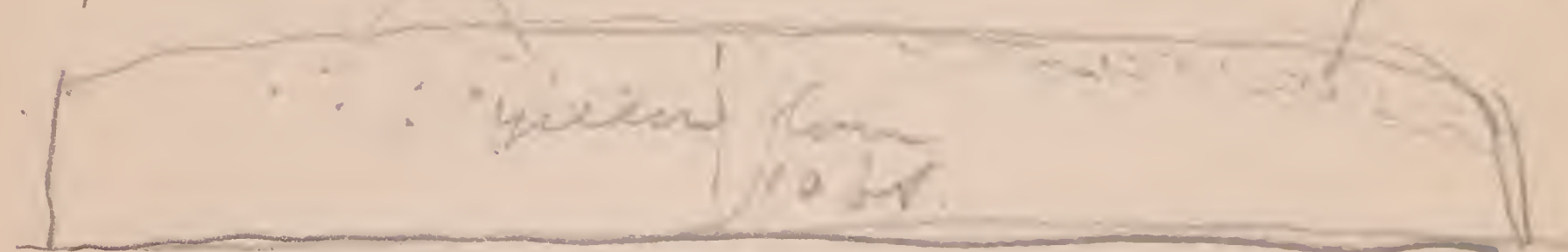
Cut 10

This is about 10 ft deep & mostly yellow brown.

1/2 block long.

A few raw nodular holes

nodular layer

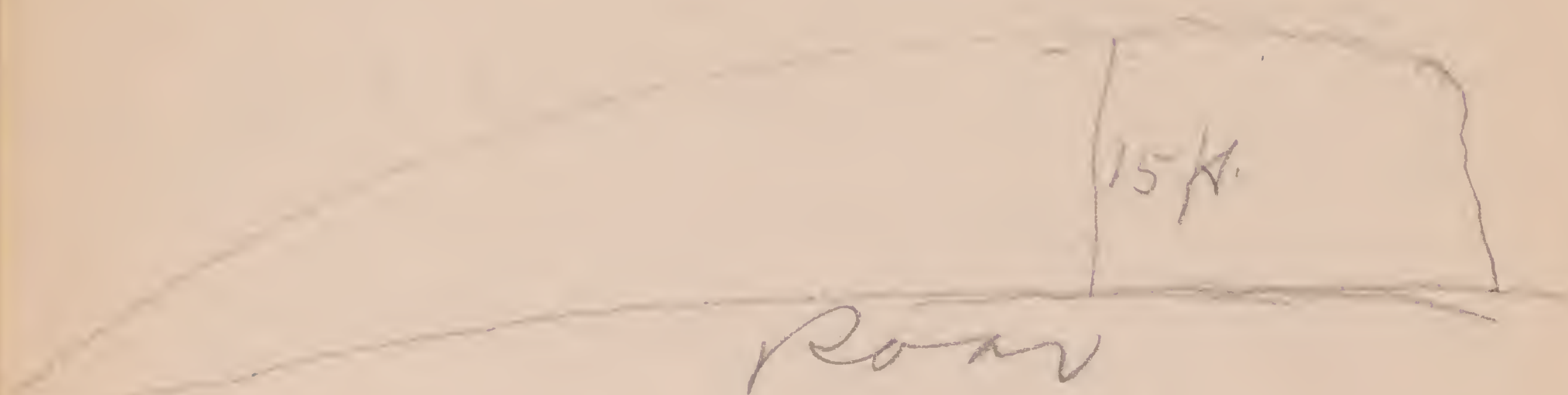


The nodules in lower part, & texture are same. So are fossils. The nodular layer runs out at W end as shown. It is 4 or 5 ft deep at W end & runs out E. The lower part toward E. The lower, looks reddish (red?)

cut 11 is low (1 ft. of first terrace & 2 or 3 of 2nd) & shows nodular upper layer as in 10 - more out overgrown & not clear.

Hardly worth cutting. Cut 11 runs whole block, but E. end is low & overgrown

Cut 12 is over a block
long, & takes down hill to 0.

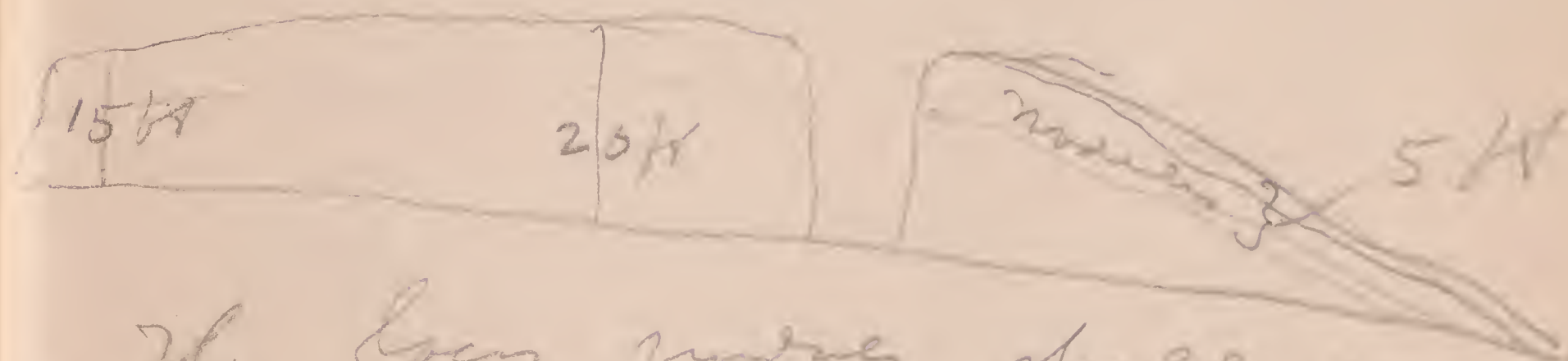


This is like those of 7, 8, 9 & 10
contains same nodules,
shells, etc. Does not
make out a distinct
nodular layer above, but
it is more or less tubular.
All over this old
weathered surface where
it became wet in the
sprinkles of today, the
red color appears. I
cut in again & again
& found this red only

A surface that
was yellow.

Cut 13 - is more or less
slumped, 5-7 ft high,
1/2 block long. Shows
fragments of shells, nodules,
etc., etc. as in 11, 12, etc.

Cut 14



The loam, nodules, shells are
same as before.

The nodular layer is
quite distinct & fully
5 ft. deep. For 1 in. this
is 1/4. Nodules small, very
numerous.

Lower layer with few
round nodules.

82

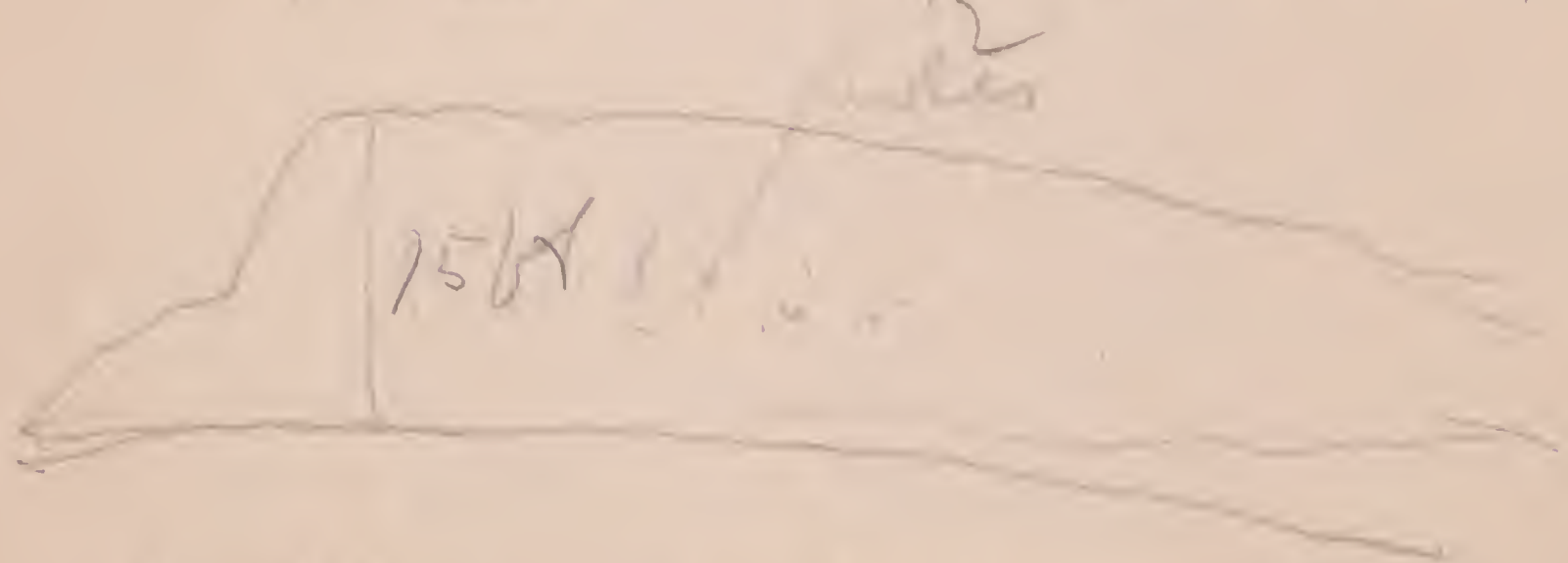
This is full of holes
occupied by English Sparrows
(Come up & take picture)

See shells,
cut 15-



Same as cut 14,
see shells.

cut 16 - $\frac{1}{2}$ blk long



Upper nodular layer
3-4 ft, with few very
small nodules.

Remains as in 15+14 83

cut 17 - about 20 ft deep
more or less shaded.

Nodules larger than previous,
especially at W. end.
About 1 block long.



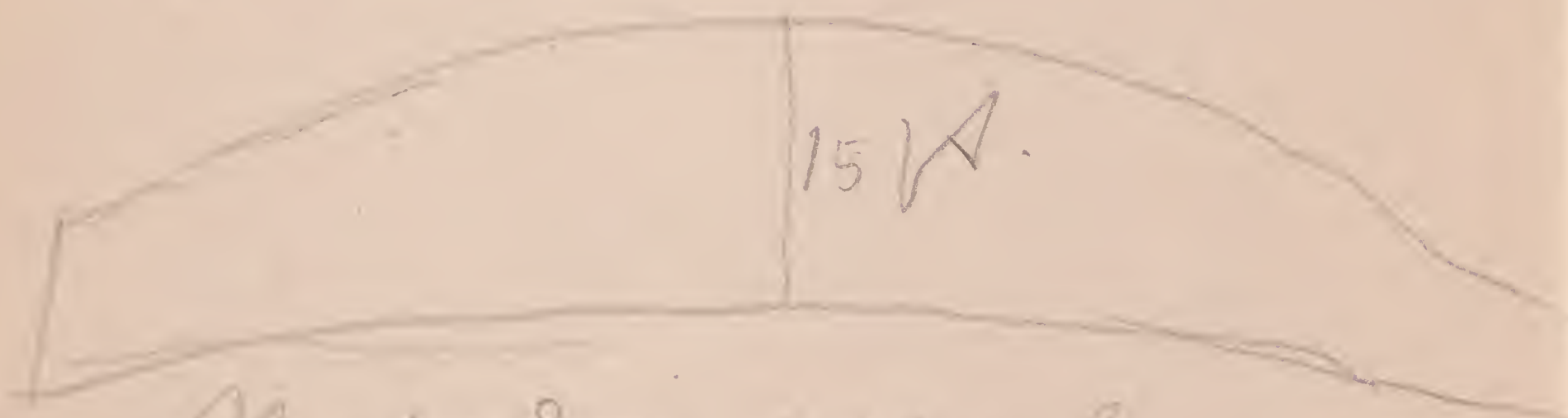
Rem nodules in lower
layer - fossils as before

cut 18 is similar.
 tubular (nodular) layer
 not always distinct, but
 present, or in its place
 a tubular layer
 see shells,
 shells few.

Looking W.
 2 blocks long



cut 19

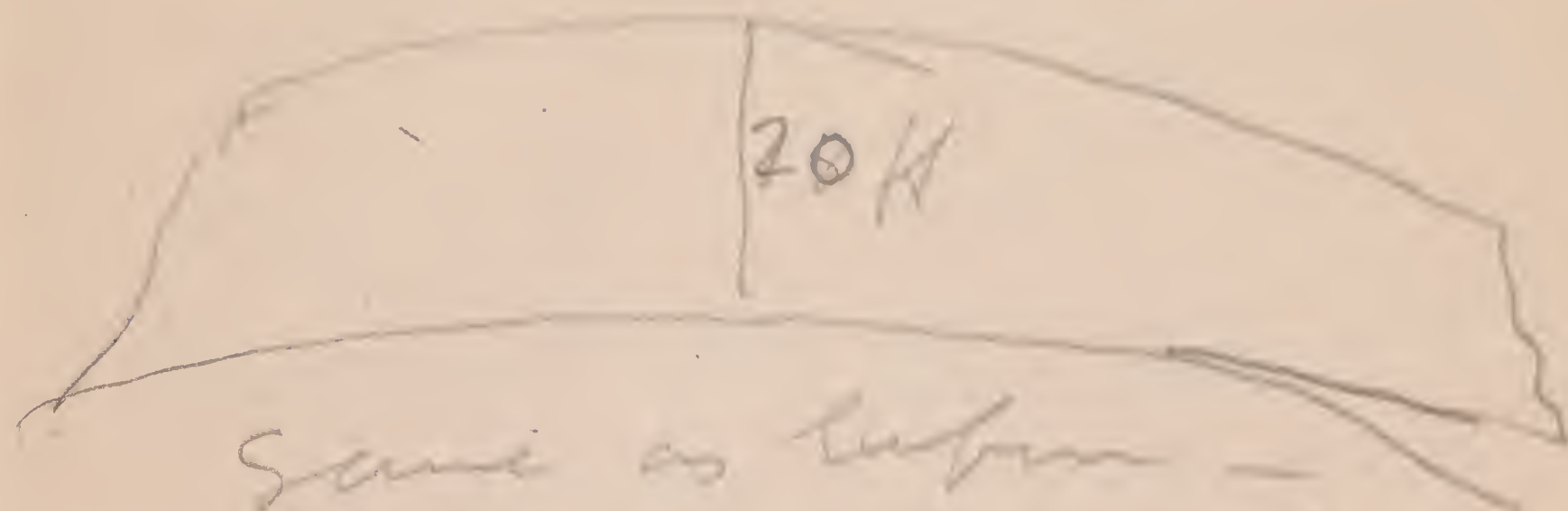


Nodular upper layer
 present -

cut same as before
 shells very few

cut 20

1/2 block long.



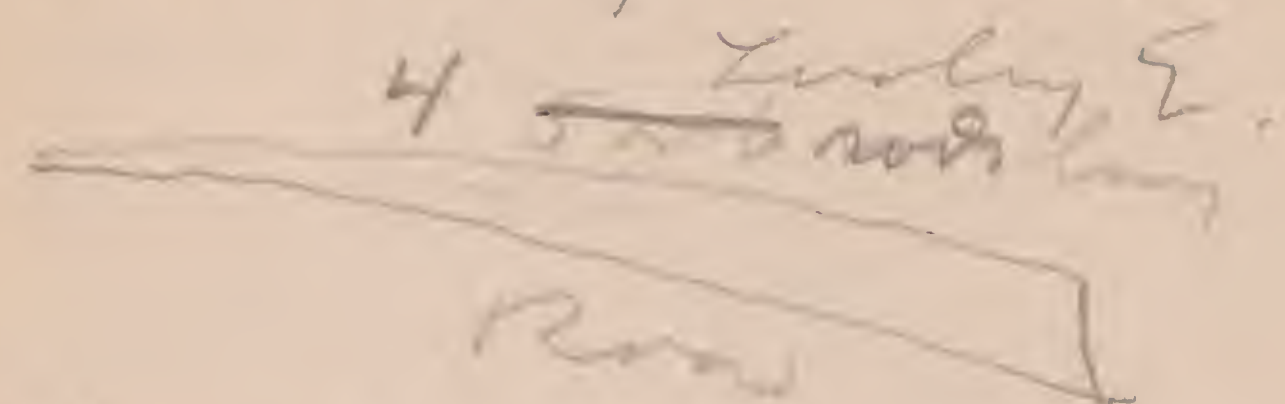
Same as before -
 nodular layer present,
 but nodules few & small.
 Round nodules more
 numerous below - also
 some fusiform.
 Lenses, etc., as before
 shells more numerous.

In all these cuts
 red surface where
 moist.

86

Cut 21

This is a low cut
extending to top of hill.



The upper 3-4 ft is distinctly
modular. nodules small
& very numerous.

Lower layer yellow clay.

1-2 ft. of fine ls
contains vintles. Traces
of *Murchisonia obliqua*?

Cut 22 - 10 ft. deep. 87

Inequality, slender &
orange.

Took sample of soft
yellowish 7 ft. from
top.

also - $\frac{1}{2}$ ft from top
no shales.

Aug, 27 - Thurs
Went to Cox's pit -

The lowest pt in road,
a little west of Claude

Cox's house = 0,

Road wth. house = 5

Entrance to pit = ~~17~~ 10 ft

Top of blue clay = 10 ft

Bottom of pit - to blue clay = 53,

13 ft

Loam
fine
blue
drift

Limestone
nodular plates

24 ft.

Loam dry
sand.

cross-bedded

Fine sand.

coarser
sand.

gravel

cross-bedded
light

14 ft.

Dark gravel,

blue clay

4 ft. fine white sand

coarse
downward, sand
+ gravel

clay balls
+ plates

The sand is rather fine,
distinctly & beautifully cross-bedded,

The upper part is all fine
sand, with iron streaks; lower
part has seams & layers of
small pebbles. It also has
streaks & claudings of iron.

The lower sand is marked
off by an oxidized band,
rather sharp above.

The light gravel, running 6 ft
& 8 ft., is rather gravel,
cross-bedded, with occasional
small boulders (4 in, etc.)

It is darker than sand
above (more iron) and is
sharply set off. Also
rather ^{more} strongly oxidized above
for a foot or two.

The lower gravel has much
black stuff in streaks,

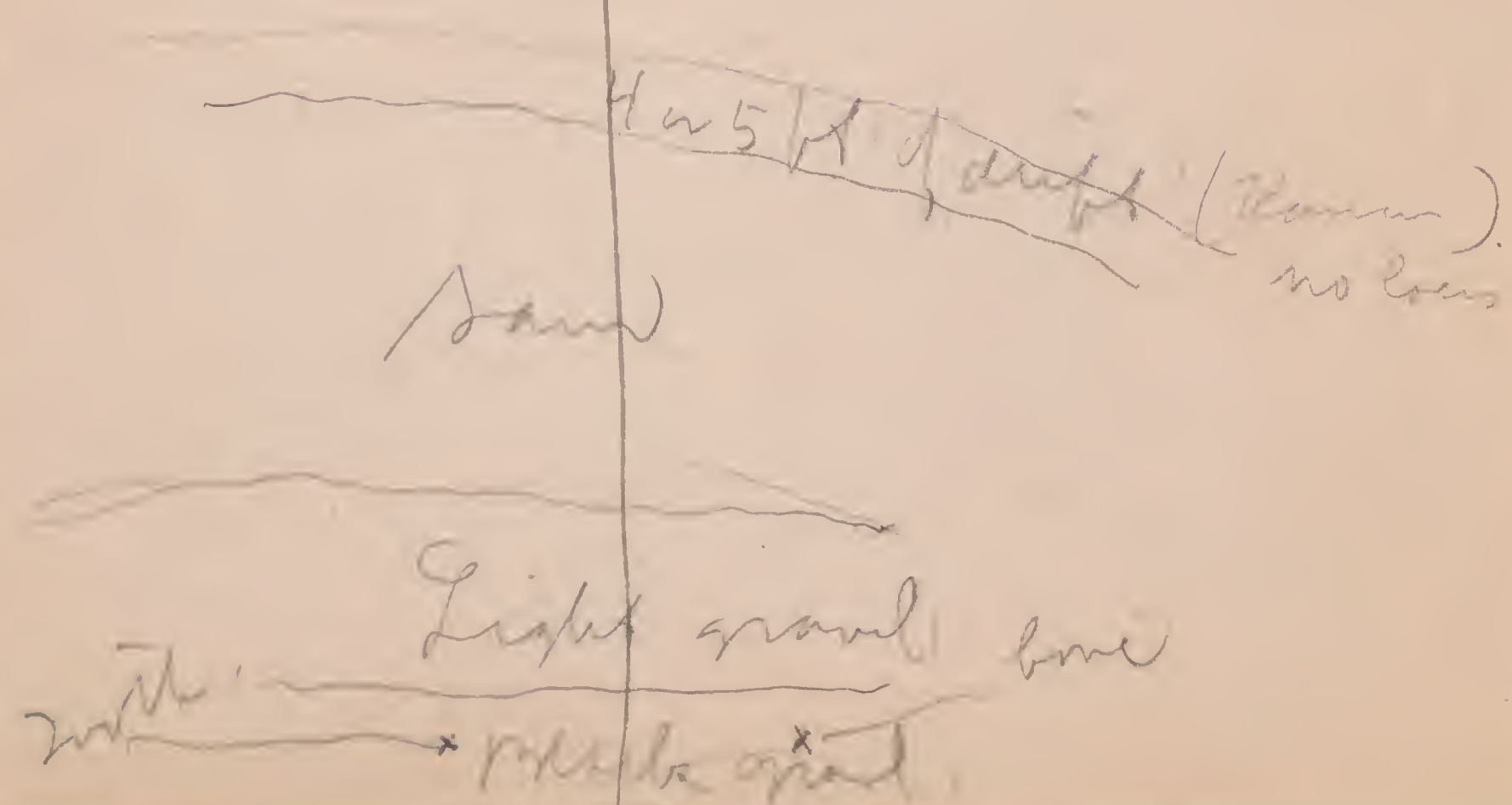
90

Bones are scattered all through both gravels, old slum came from blue gravel, & the one recovered today from light gravel.

The mastodons(?) teeth & bones were taken from black layer, about 5 ft. above its base. They were at same level.

The section on p. 88 is shown looking E.

Looking S. section looks thus:



91

The sand is separated from blue drift by a layer of nodular plates, usually 2-4 inches thick.

Above this is a layer of blue (Kauai drift, which becomes yellow above (with iron). The pebbles in the upper part are the usual rather fine, white-crowned pebbles of the Kauai. There is a strongly oxidized layer in lower part of blue Kauai, & some in blue above.

Road above pit reads 55 ft. Level begins about at road & runs up hill.

The rise runs to 160 ft above bottom of pit (reading = 157)

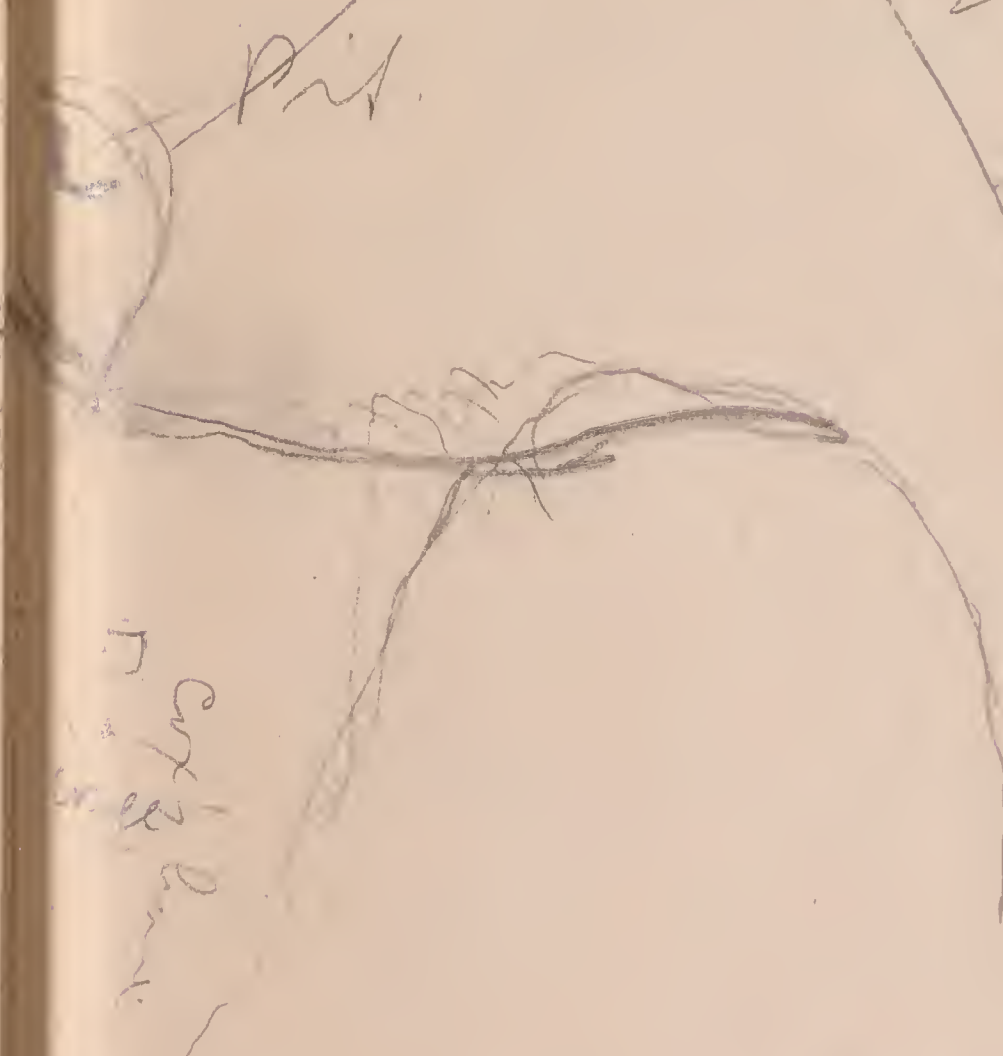


I took out a nicely bleached
 fragment from Klamath blue
 clay, - its lower part, - a little
 below middle.

at Cox's well 105 ft. above bottom
 (Reading = 102)

Early
 morning

Well reaches 127 feet
 before water struck.
 Clay + blue joint - 40 ft.
 Sand + gravel, rest.
 There water in gravel.



Pit.

Cox's well

The same in pit
 runs out with
 very same, the
 gravel appearing
 under drift.

The higher part of the
 ridge above pit is loess
 long bank with round
 cat-steps, etc.

Loess appears all along above
 road & in road, but
 it is thin, & below road
 gravel shows in places, which
 yields for corn.

E

Cut 189

Family iron. yellow.
 round nodules - upper
 nodules larger and distinct.

12 ft. deep.

Red ferrite is extreme
 just at road level.

Cut 87. Simila - 6 ft

deep. Fragments
 of shell.

Cut 88 extends S. up
 hill, & seems to be like

Cut 87.

Minor cuts taken along
 road between cut 89 &
 Cox's pit, & they all
 show nodular layers above,
 with numerous small
 irregular nodules.

96

Aug. 28. Friday

Packed basket & pen.

continued work on loc. of Mrs. Valley

Commenced with cut 23.

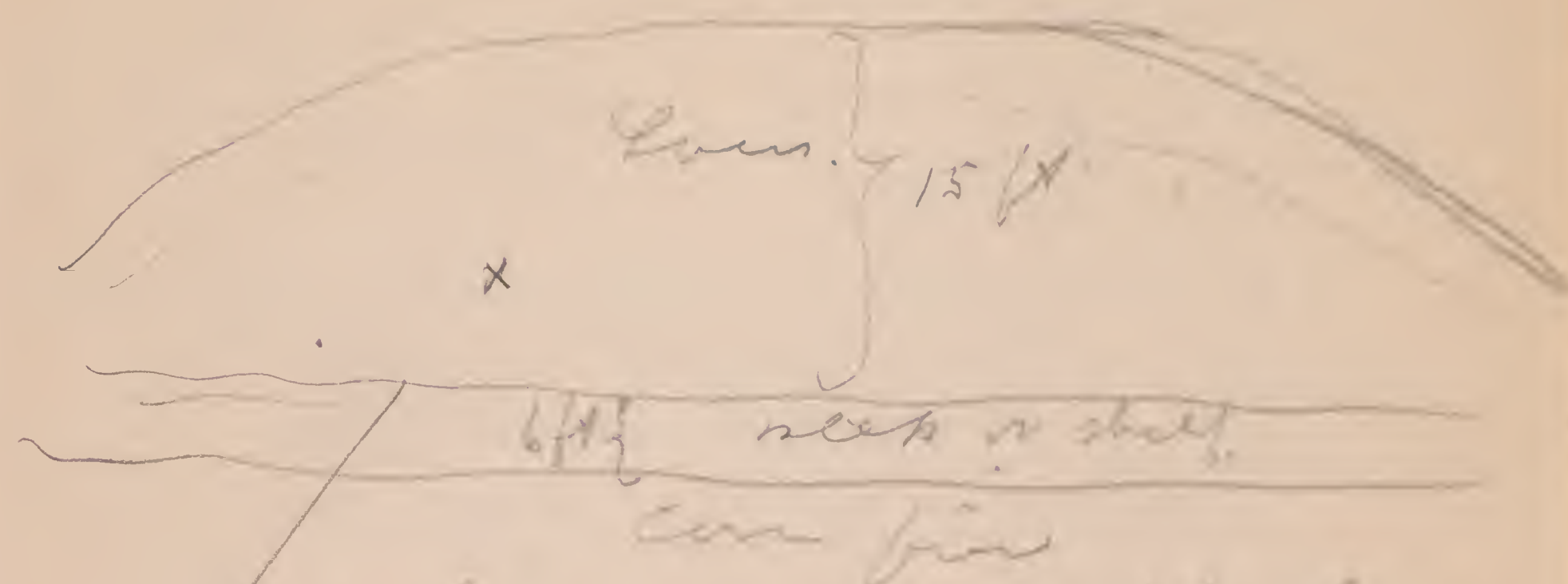
Cut 23.

(Really started at cut. 28)

Cut 28. This is on S. line of
Rosedale cemetery, & is about
8 ft. deep, - on slope down toward E.It is slumped & overgrown, but
as far as I could see it shows
fine grains, light, light yellow
upland loess, - no fossils or
nodules being visible, but
exposure not clean.Cut 29 is in yard, where grading
exposed it. It is irregular,
perhaps 10 ft deep in places,
partly slumped, & as far
as I could see like 28.
Cut 30. Is irregular, back of
houses.

Cut 26 is over 20 ft deep, 99

+ a fine exposure.

This base is about 8 ft above
road.The main loess is yellow,
light, with scattered brown
nodules, & scattered shells.
I found 2 little shell
layers - one about 3 in long
& other about 2 - shells common
& layer only ^{or so} 2 in thick.

See shells & sample (at x)

Also nodules.

The upper 4 or 5 ft. show
small nodules loose
stuff. Small nodules
common.

cut 23 - E. side about 18 ft. & some yellow loam with fragments of fossils. Took a few ~~small~~ took sample at 15 ft below top.

Nodules almost absent. On side slumped & overgrown.

Took sample at W. end (where cut is 6 ft. deep only) at 2 ft. from top in nodular layer.

Also one 6 ft. deep in top of lower loam.)

Nodules are not seen in uppermost 3-4 ft.

Cut 24 - On E., N. & W. sides is badly slumped & overgrown, but as far as I could see is same as 23

cut 24^{5 m} is also same - 8-12 ft - now is in a fault zone. This is about $\frac{1}{2}$ way down hill. cut 25 is a small cut 4 ft deep - upper 2 ft nodular. Found shells & a few round nodules. Some yellow loam about 8 ft. below the 170 ft. point.

Cut 27 is more or less slumped & overgrown but as far as I saw is like cut 26 - I did not look for fossils.

If counts of two parts, the lower is about 117 ft. & about 8-9 ft. deep &

more or less slumped. Found success in upper nodular loam.

Fossils, nodules, etc. as before.

The upper cut extends almost to top of hill, & is about 12 ft. deep. Lenses, nodules, etc (including upper nodular layer) same as before, but I could see no fossils.

Cut 31. is overgrown, & not satisfactory.

Cut 32 shows about 10-12 ft. of yellow loam, - more or less clumpy. In yard south, about 14-20 ft.

Lenses, nodules & fossils as before. Base is about 10 ft. above intersection of streets.

Cut 33 -

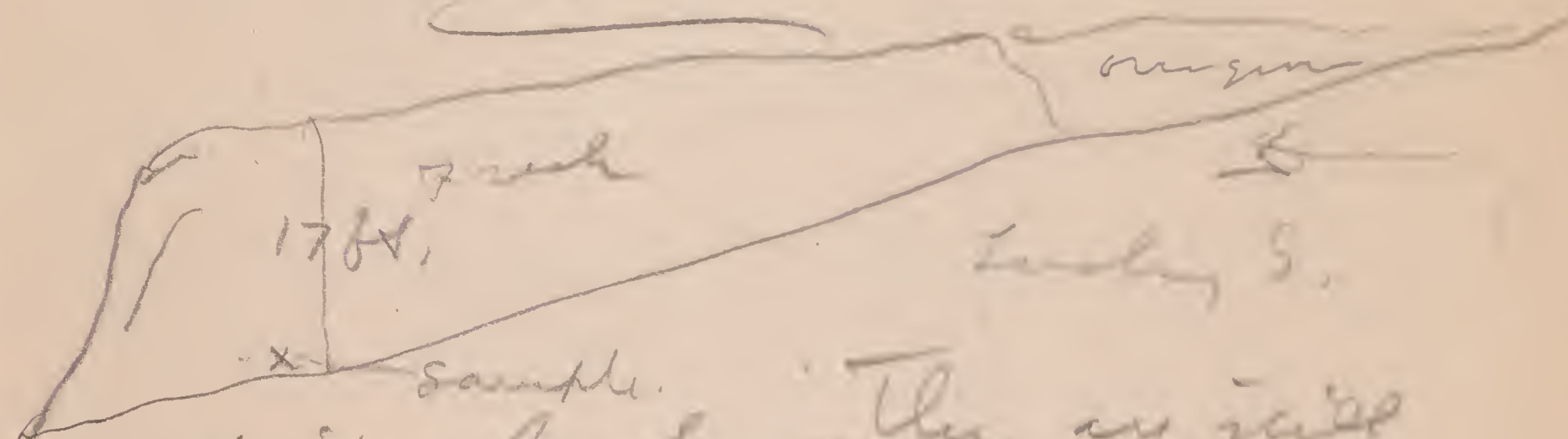
This is mostly yellow loam as before - nodules, shells & all. Upper layer nodular.

The fossils - there were mostly in lower part & partly from surface.

Lamination shows distinctly in upper surfaces.



Cut 34



This fresh, - They are well cutting. It is yellow loam with chocolate spots.

I found one *Assinia* thin in upper nodular layer, which is about 4-5 ft. thick.

Took sample 17 ft. from

top. Here nodular layer = 5 ft.
yellow loam = 12 "

Few nodules appear on this side, - but they

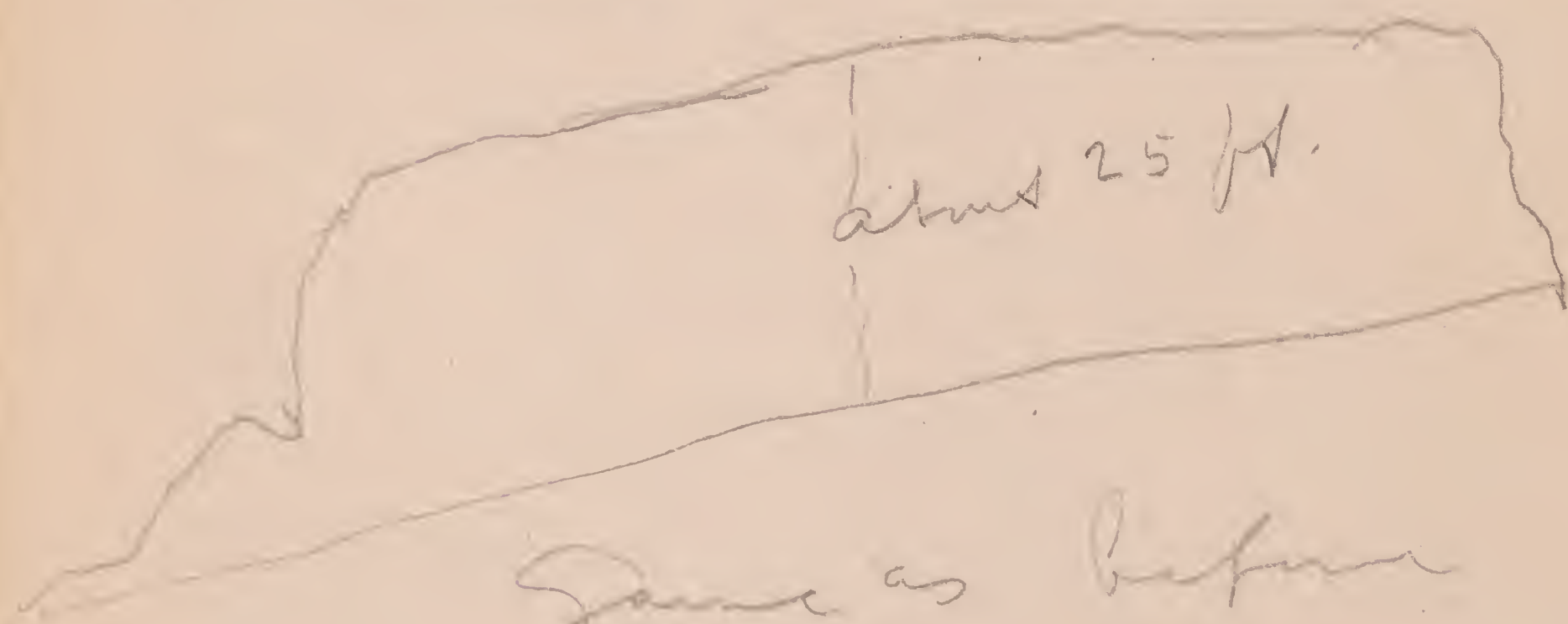
do occur. The E. end of the cut (at base) is a chert with fossils.

cut 35,



Same yellow ~~lamin.~~ ^{moderately}
 also same Drop to
 fossils very few. here
 Lamination distinct on
 weathered surface, in lower part
 small box fossils.

cut 36 - 2nd size box of fossils.



Same as before
 moderate lower
 fossils in places in
 both 35 & 36.

Lamination distinct on
 weathered surface, where
 there is no thin overwash.

These cuts are both
 downed, as the loam is cut
 back of them & they are
 more walls.

cut 44 - 1/2 block.



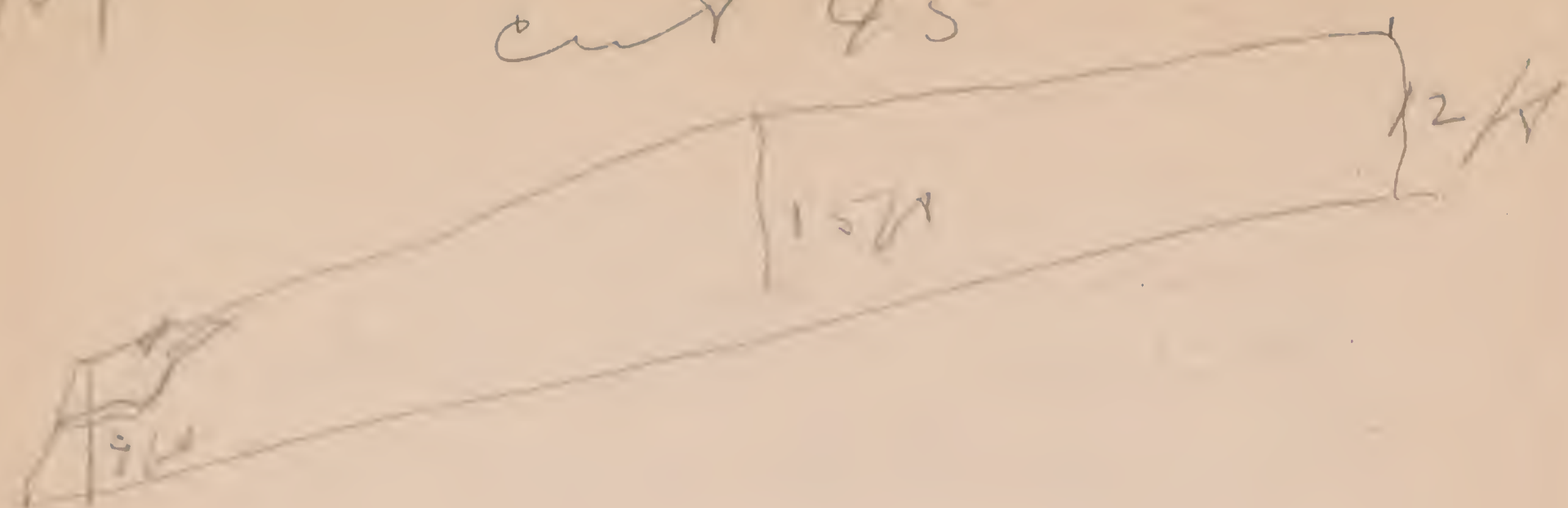
Modular layer shown -
 nodules not very numerous.
 Shells few scattered.
 Lower loam with rounded
 nodules.

All same as
 before.

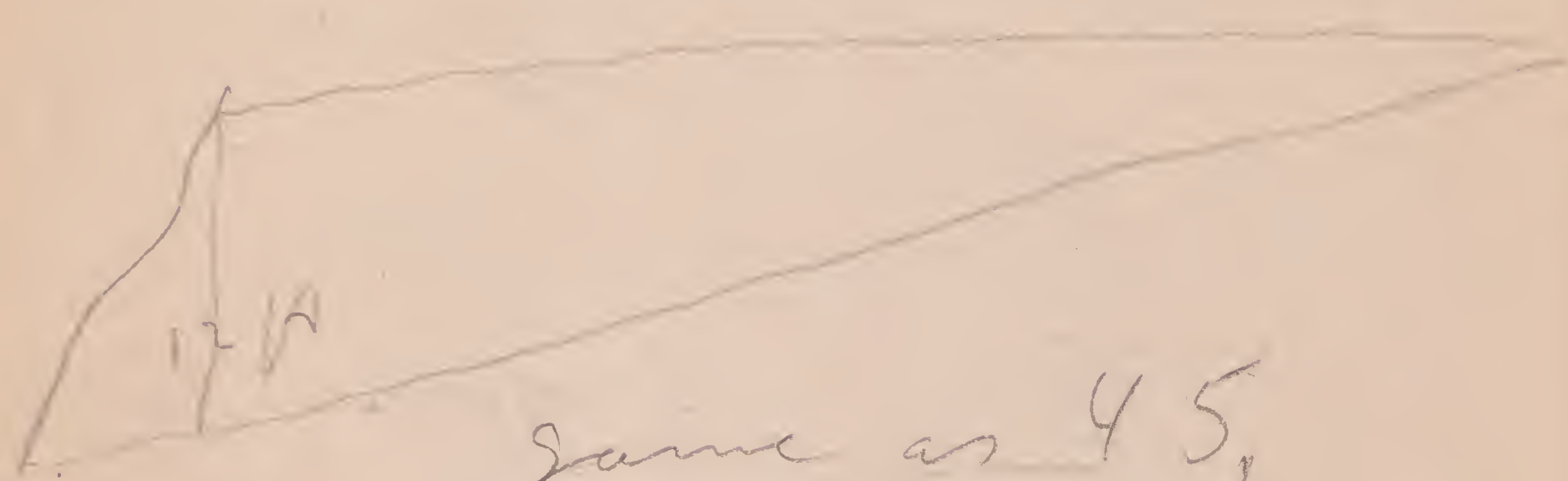
Cut 45 is a block of
 yellow loam, few small
 nodules - very few
 shells.

104

cut 45



cut 46 is continuation
across turn, $\frac{1}{2}$ blk. long.



same as 45,

Only a very few fragments
of shales, - not identifiable

nodular layer present, -
nodules few.

105

cut 47 - S. side



nodular layer present,
nodules not many.

Locs as before.

Fossils very few & mostly near
E. end.

E. end is shaded & uneven

Took sample 3 ft from top
(in nodular layer) & 12 ft
from top - at base of cut.

In afternoon I set up apparatus & took first reading at 4⁰⁰ - 4²⁰ ^{o'clock}. The day had been exceedingly milky, & for the most part sunny, though hazy. On the hills a breeze could be felt early in the morning. The wind all day was from W. of S. & S. In afternoon (later half) it veered to S.E., & blew that way all night. It was sufficiently strong to sway branches most of the time.

When I took first readings the wind at point 4 was scarcely noticeable, at point 3 the strongest, at point 1 strong & at point 2 almost nothing.

Aug. 29 - Saturday, 1897

The sky was cloudy in south, & could hear thunder. Wind was strong enough at 6 o'clock to sway branches. Light dew.

The anemometer set up shows only a difference of 25.2 mi. from 7 am yesterday & 7 am today (but as wind is from S.E. the point (sta. 1) does not catch the wind).

When I took pan readings at 7 am, sta. 4 felt breeze a little (very little), sta. 3 more decidedly, sta. 1 fairly, and sta. 2 scarcely at all.

I checked Central Psych. 1 & 2 at 7, and they were less than $\frac{1}{2}$ degree apart.

At 8 o'clock reading old sta. 9 was exposed to stiff S.E. breeze & new station scarcely at all.

10th

At sta 4. 8⁴⁵ 75 $\frac{1}{2}$ - 70

on top of hill. 75 - 70

strong S.E. wind

(5211 ft from 950-955)
on top

(4407 from 940-945
at 4)

Harold Tucker
is helping.

Again at 9 checked

Psych. 1 & 2 (center) &
from them less than $\frac{1}{2}$ degree
apart. In both cases

the dry thermometer
registered nearly $\frac{1}{2}^{\circ}$ more on
no. 1.

Readings at Pans 3 & 4 at

8 & 9 were 20-25 min.

after the hour. But always

in order 1, 2, 4, 3.

At 9 - 1 was windy & somewhat

drum, 2. shady & quiet,

4 (old) quite windy, 4 (new) almost quiet,

3 - quite windy & both 3 & 4 sunny

10th

at 10. no. 2 was slightly sunny

(through leaves) & a scuffle

between stems leaves.

no. 1 quite windy & sunny

at 4 (old) windy & cloudy

" 4 (new) somewhat windy & cloudy

at 10²⁰ below at 3 was 529 ft

a minute.

at top of ridge = 740 ft. per mi

(cloudy)

78 - 70 $\frac{1}{2}$ - top of rock

77 - 70 - station 3

At 10 & 10³⁰ A storm was

brewing in the north - could

hear thundering.

Part of the hour for 10-11 was

sunny.

at 11 - 2 shady.

1 shady

4 (old) shady & little wind

4 (new) somewhat sunny & little wind

at 3 " " some "

86-74 - at top of rock - 3+
after reading at (3)

(3 - 84 $\frac{1}{2}$ - 72 $\frac{1}{2}$)

at 12- station 2 - sun (shade
of leaves) + little gust

station 1 - sun + wind.

" 4 (low) sun + wind

4 (sun) " " less "

The Cuspe scrap, at (2) was
partly in shade & partly in
sun (between leaves).

at 1 o'clock it was quite
sunny (though hazy) & the
apparatus at 2 caught
lots of sunlight, the wind
had veered to due S.

at 4 o'clock some wind, at
noon & almost none.

at 3 wind very strong.

The transition belt between III

1 & 2 is about 2 rods wide +
contains:

Rhus glabra (low)

Symphoricarpos (low)

Rhus oak ()

Acer glabrum

Monarda (rare)

Gerardia (high)

Aster sericeus.

Ammannia ciliolata

Helianthus (get spec.)

" *rigidus*

Ceanothus

Fragaria -

Saxifraga oppositifolia (low.)

Eupatorium altissimum

Young green ash.

Poa pratensis

Lithospermum (by *brunellina*)
veridulata

112

At 2 o'clock it was still quite sunny (but hazy) & the wind shifted to W. of S. It was quite strong.

At 3 o'clock - Same
windy at both New 4,
very windy at 3, & also at
1, & just gusts at 2.
Wind W. of S.

At 4 o'clock - Hazy sunny,
with wind moderate at
old 4, light at new 4
& very strong at 3. Also at
2, very little gusts.

At 5 o'clock. Hazy sunny,
brighter than at 4,
wind S., sky nearly clear
At 2 calm; at 1 moderate
breeze.
at old 4 - sunny & good breeze
at new 4 - nearly calm & sunny
at 3 (still hazy) & stiff breeze

113

When wind - from due S.
the entire S. of the 1. moderate
wind, as it projects.

At 6 o'clock

2 - Some sun, almost no
breeze.

1 - Sunny & breezy

4 (old) Shady & breezy

4 (new) - Shady & slight breeze

3 - Sunny & breezy & a moderate
breeze.

At 7 o'clock
all in shade & wind
somewhat subsiding.

114 Aug. 30-1908

Set up one station at
6th & Woolworth Ave. on
a ridge just opposite Woolworth
& W. of 6th. This was
timbered, but now shows only
a few trees. It faces N.E.,
& is well exposed S. & S.E. & E.
(i.e., there are no buildings
to interfere, the field being
clear for our purpose.
The area is now overgrown
with blue grass, and
of course some weeds.
The area is typically
of the kind usually
covered with forest on
the Nebraska side.
Mr. Gilder says in digging
he finds black soil on
W. side of river (on ridges)

but not on E. side. 115

My Council Bluffs
stations were same as
before.

116

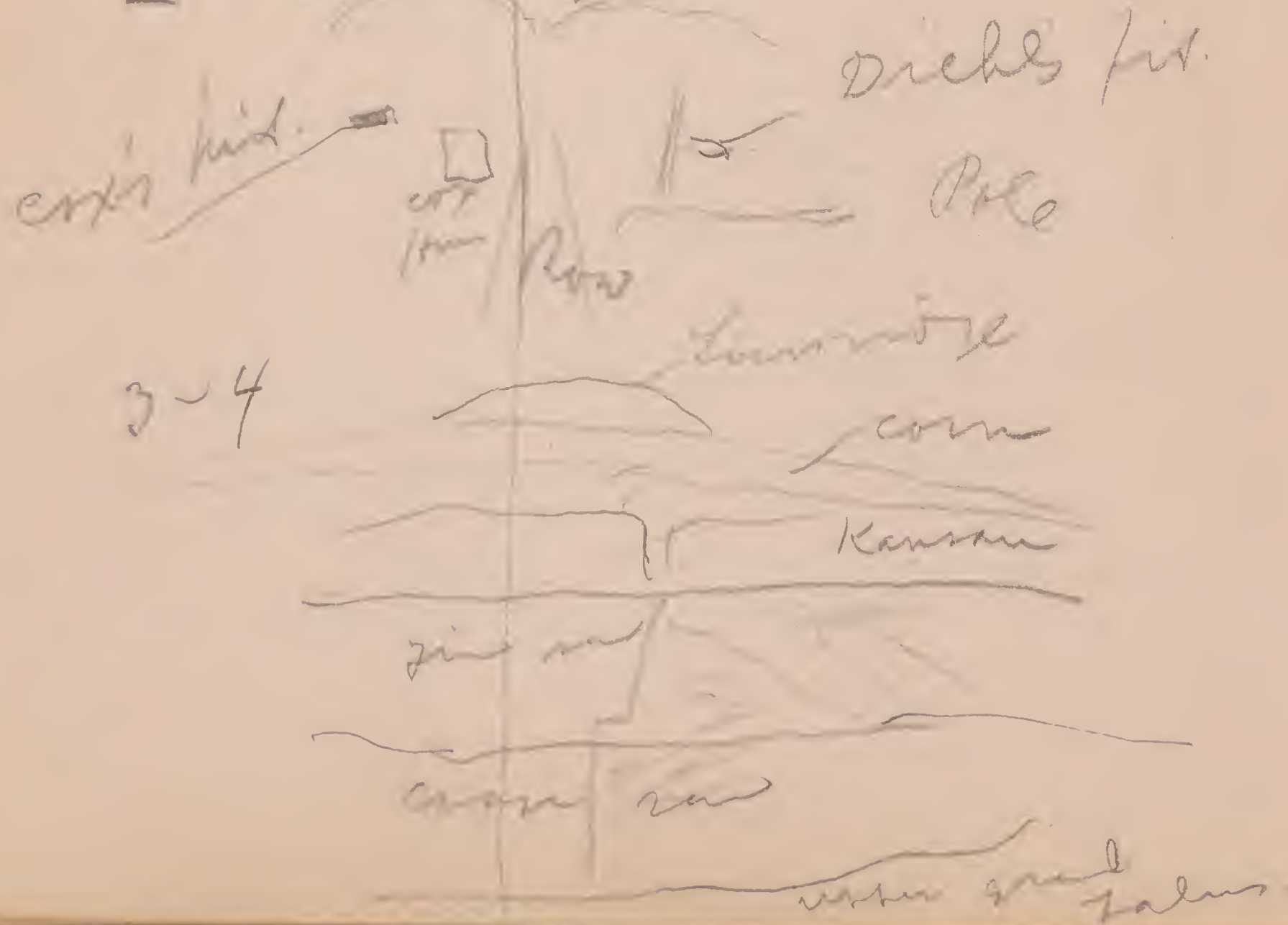
Aug. 31 - Monday

Rain nearly all AM.
 Returns to M. Valley at noon
 & at 4 o'clock drive out to
 Cox's pit.
 The drift above sand (Kansan)
 is heavy bluish joint
 clay, with pockets of sand,
 pebbles & oxidized stuff.
 There is no real yellow
 joint clay.

Took photos:

1- Look E. toward Cox's house
 + bluffs in which
 gravel pits are found

2. Kansas river



3-4

117
 Took sample of Kansan
 joint clay 3 ft. from base
 photo (586)



Found piece of limestone plate
with glacial markings, suggesting
that this layer has been from
Lafayette ice came. (see spec.)
The boulders & pebbles in
gravel layers are worn &
rounded, - even where
angular, not sharp.

Contents in Karna -
pitted granite, greenstone,
red iron Quartzite (looking
fresh) etc.

There are also sand & gravel
(some large) in both
sand & gravel.

9- Look N. of E. Cox's pit
is just above & to right of
top of small tree between
Cox's house & barn.

10- In center of field &
just above the sunflower
in John Dicks' pit. Looking
S. of E. from same pt.

The wind was westerly, &
the sky was a low haze
it has been all the time.

Spent evening in writing
letters, & packing for trip to
Tulsa.

Sep. 1 - Tues., 1908

Day very fine, pleasant, almost
no wind.

Started for Oklawaha at 7:05 AM.

Reached Oklawaha in time to
get freight for Tulsa.

Reached Tulsa at 9, & met
Mr. ^{A.B.} ~~Butt~~ at depot.

He has a sand pit up

The small valley on the north
which shows now about
12 ft. of sand, cross-bedded
beautifully, - coarse sand &
finer gravel above
in streaks. It is identical
with the upper, or sand

layer in Cox's pit at
 Mo. Valley. There are
 also nodules of blue joint
 clay, as at Cox's.
 Oxidized shales & bands are
 also common.
 The clay nodules were
 evidently rolled into
 their fusiform, cylindrical
 or spherulic form by water
 on the old bars ^{and bottoms} and
 then covered by the sand,

122 Arcola woods. Fishers road

~~Juglans nigra~~

~~Ulmus fulva~~

~~Salix amygdaloides~~

~~Celtis~~

~~Fraxinus lanceolata~~

~~Filix americana~~

~~Symphoricarpos occidentalis?~~

~~Rhus glabra~~

~~Pachyrhizum glaberrimum~~

~~Ribes nigrum~~

~~Corylus americana~~

~~Cornus canadensis?~~

" paniculata

~~Acer negundo~~

~~Populus deltoides~~

~~Celtis~~

~~Vitis vulpina~~

~~Crataegus mollis~~

~~Salix discolor?~~

~~Rubus occidentalis (Red)~~

~~Prunus americana~~

123

From on dry ridge a
little crabs - some
like crab

✓ Photo 1-2 Looking NW - across
protected valley.

✓ Photo 3-4 Looking N. from same
point

✓ Photo 5-6 Looking ~~SW~~ ^{E. 45°} at
point on protected slope

✓ Photo 7-8 Looking SE from
same point

Cut 2 is on top of dome
 & shows 15-18 ft of yellow
 loam - laminated in
 weathered parts

In some pits picked out
 scattered pieces of *Sphaerium*,
 pieces of *Uros* & a variety
 of fish

✓ Photo 9 - View of Maple
 valley looking toward Carleton

✓ Photo 10 - View of bluffs
 near Fischer's.

Add to list
Cervulus *tridactylus*
Neubaueria - small
Helicostoma *annua*

Went back to Tivoli.

✓ Photo 21 & 22 looking N

View of pit at Tivoli

✓ Photo 23 & 24 looking N.

From ridge just above Tivoli
 stone both within & outer
 boundaries, both exposed & both
 broken.

On S. side of bluffs in the
 bluff in distance are high, but
 they run down toward the bluffs
 & finally end in short plateau



126 collect (in Elliott's pit)

<i>Sphaerium</i>	<i>Anacylus</i>
<i>Protium</i>	<i>unio</i>
<i>Lunium</i>	
<i>Physa</i>	
<i>Segmentum arctium</i>	
<i>Planorbis bicarinatus</i>	
<i>Amnicola</i> (or <i>Physella</i>)	
<i>Valvata tricarinata</i>	
<i>Planorbis dilatatus</i>	
<i>Polygyra</i> ?	
<i>Pyramidea albicollis</i>	
<i>Lucina olivacea</i>	
<i>Valvata</i>	
<i>Gastrea</i>	

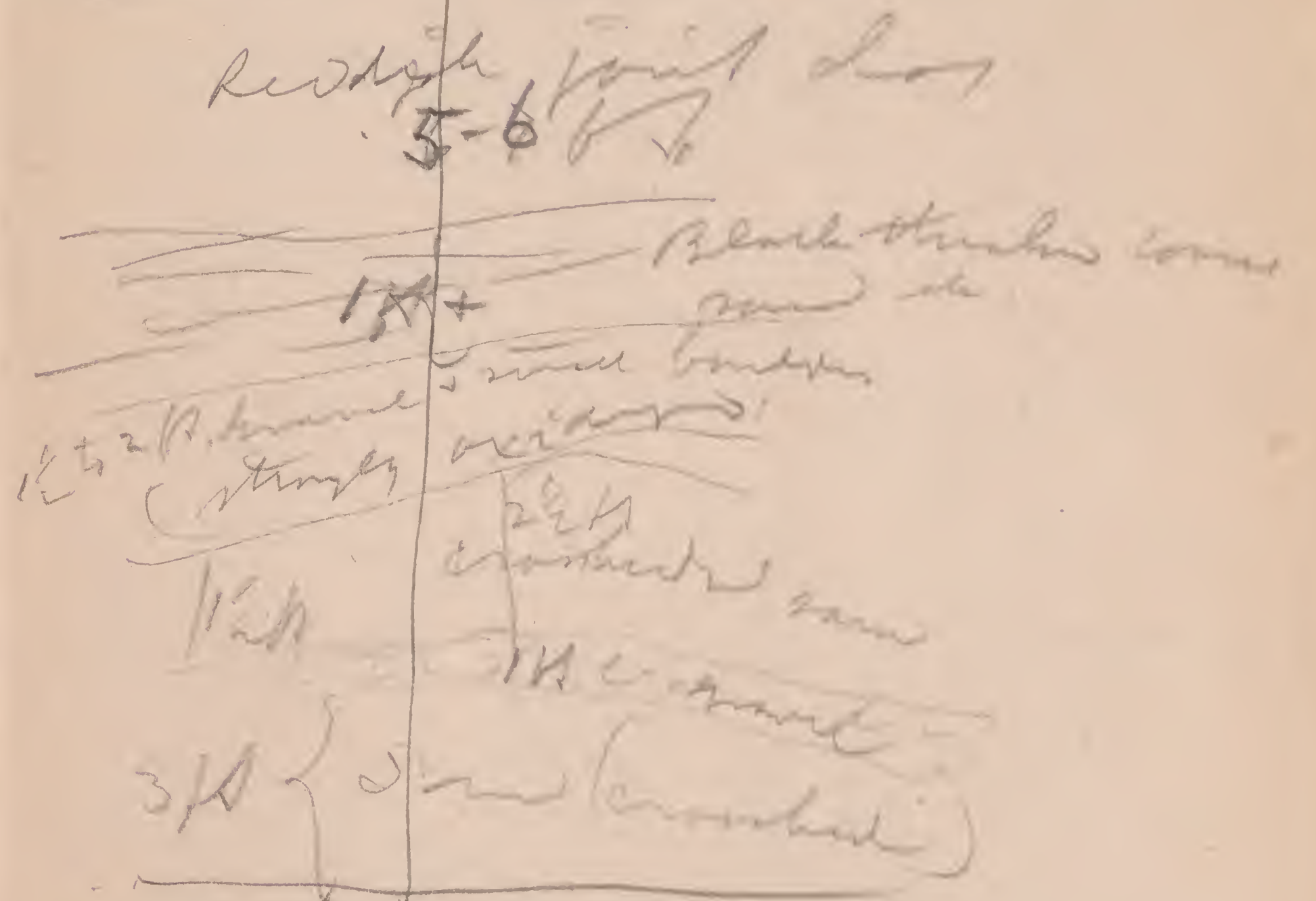
collect but

✓ Photo 27 & 28 - Pit
and 2 ft (deeper higher up)



127
Found small piece of
worm bone in upper
part of sandy layer (above of
of pit).

(N.W.)
On E. side of pit (always
half) this shows



Total exposed sand is
now about 12 ft.

The man in pit found a
large *unio* (body full of in)
a good (small) one a
North, - probably here, but flat

126

Cut 1 - 2 mi



all loam

Uppermost loam in part, 2 a
3 ft. shows small nodules, 1/4 in
before.

Sample (a) 2 ft. above base

(c) 2" below top

At 12⁴⁵ started for Easton.

The road follows about 10 to
50 ft. above bottom.

In the stretch from Durin to
cut 3 - Kannon drift, ^{or gravel bed} shows in

several places in road. At cut

a little loam appears on

Kannon, with fossils more distinct

Took photo 29 - looking
NW.

127

Cut 4 - also on higher point of
road, is irregular, on W. side
road, 5-7 ft. deep, & shows
upper 3 ft (small) nodular loam.
Lower part rather compact
yellow (brownish) loam without
nodules & few shells. See box.

cut 5 - on W. side

Shows 7 ft yellow loam
with few small nodules below
& some small ones above.
No fossils.

cut 6 is similar 9 ft. deep
no shells.

This shows lamination and
surface which may be due
to wind blowing stuff

against it, - though it
follows contour & is regular.

Kannon gravel shows in road

This is right at angle of road
on W. side. It is again a

mountain higher point.

That lamination cannot be
seen with the loose breaks O.R.

130 The water part is soft, however,
and may be partly overwash.
Cut 7 is at next angle. Right
at road (new side) The bank
& road bed show Kansan drift
only, but away up, probably
75 ft. higher there is quite a
bank of loess due to slumping
& reaching nearly to top. It is
yellow loess.

Cut 8 is a similar slumped bank
of loess, away up near top,
& new of road.

Kansan drift appears along road

Cut 9. This is far up hill &
slumps like 2 preceding.
✓ Photo 30 is taken N. of E.

The road is 35 ft above creek
(Chino) & shows Kansan drift (at
this the highest point)

Cut 9 is — ft. above road
(to base) & is about — ft
high

Drift still shows on slope
well 60 ft. above road,

Base of cut (reference base) 131
is 80 ft. above road, cut is
30-45 ft. high, & top of
bank is 165 ft. above road
I found fragments of Union &
a pebble on top & an evident
channel & flint chips.

A gravel pit between road
& cut 7 (S. W. of latter) shows
cross-bedding, etc. It is evidently
very gravel layer, interglacial
5-6 ft. exposure.

Where there is much loess
exposed in road to north
it is probably this &
Kansan above it.

Fossils in cut 9 are
much more abundant on
E side of cut.

- 19 } ~~Scraped near station 2 - p. 62~~
~~ported~~
 20 }
 21 } ~~Scraped,~~ " " "
 22 }
 23 } ~~not very good~~
 Looking up Soldier riv. from bridge
 S. near sec. 28 - p. 64.
 24 } ~~good~~
 thin (just)
 Looking up Mo. river from bar W.
 of mouth - p. 64.
 25 }
 26 } ~~O.K.~~
 thin (just)
 Mo. bar showing small
 27 } ~~Helix fluviatilis~~ p. 64
 28 } ~~O.K.~~
 Looking S. into cottonwood forest. p. 67
 29 }
 30 } ~~O.K.~~
- 25
 = taken Aug. 25-26
 5 } Sand dune with Cassia & Cottonwood
 + a little Dalea - p. 67
 6 }
 7 } Saw dune & pool.
 8 } all not marked are O.K.

Box 3 - Aug. 31 - 1908

- 1 - Looking E. from S.E. on town cross - Mo. Valley
 2 - " " nearer point " " -
 3 } Cox's pit, looking S.E.
 4 }
 5 } Cross pit (nearer) looking S. of E.
 6 }

- 7 } Looking E. (still nearer) Cox's
 8 } gravel pit, Mo. Valley.
 9 } Looking N.E. toward cross pit
 10 } " S.E. " Diehl's "

Box 4 - Sep. 4 - 1908

- 1 } From Fishers hill - NW. across bridge
 valley, 9/1/08
 2 }
 3 } Looking N. from same point,
 9/1/08
 4 }
 5 } Looking E. & S. at forest in
 protected valley - 9/1/08
 6 }
 7 } Looking S.E. from same point.
 8 }
 9 - Maple valley - looking toward Castana 9/1/08
 10 - view of bluffs near Fishers 9/1/08
 (late)
 21 } Looking N. - View of pit at Turin
 9/2/08
 22 }
 23 } Looking N. from river just above
 Turin (from X), 9/2/08
 24 }
 25 } Sand in pit showing - Turin
 26 } cross bedding - 9/2/08

Box 3 - Sep. 4, 1908 (planned on top)

- 11/12 - Maples, Logan, 9/4/1908
 27 } See note p. 128, Turin 9/3/1908
 28 } O.K.
 29 - End of box river Turin 9/3/08 - p. 128
 30 N. of E. river just cut 9 - Turin 9/3/08

Returns from Omaha for
supper - Monday, Aug, 24

Monday - 11 -

Tuesday - 11 - out dinner & supper

Wednesday - 11 - " breakfast.

Thursday - 11 - " supper.

Friday - 11 - " dinner & supper

Saturday - 1 - " dinner & supper & 2 lunches

Monday - Had dinner, supper, lodge

Tues - Breakfast

Aug 25 - Meals
middleton out - meal 2.5
Feed - team .35

Aug 26 - Bicycle - express 1.25
Lunch - morning .25

Aug 27 - Lunch 30 Bachelors 5 .30

Aug 28 - " 25. Pipettes 10 .35

Aug 29 - " 25, Fare & Oak .68
car fare .65

Aug 30 - (Sunday)

Aug 31 - Horse & buggy 10
Telegram to home 40 Prok 10
Hotel Butler Aug 24-29 - 6.50

Sept 1 - Fare to Omaha .77
Fare to Turin .14

Sept 2 - Lunch - Turin .25
Castana - lunch 25 100 2.55
100 25

Sept 3 - Castana - living, lunch 25
Turin - lunch 25
Fare Omaha to Mrs. Daley .77
Omaha - hotel 1.00

Get - Engineering News
220 Broadway, New York.

Aug. 13 - 1908

contains Gammesky's
article
Evaporation from the
Salton Sea

Aug. 17 - Car fare -	.85
Meals Council Bluffs	.70
Hotel	1.00
7-8 RR fare to Mo. Valley	43 + 15
19	
20 - Lunch Birtown	.50
Horse feed	.20
Lunch, Mo. Valley	.45
Fri. " 21. Papers ²⁰ baskets ⁵ , box ¹⁰	.35
	9.00
Sat. " 22 - Hotel Union Aug. 18-22 -	
Living, Bremer & Robinson	5.00
Aug. 18-20 -	
RR. to Council Bluffs	.43
car fare	.30
Lunch	.35
" 24 Car fare Omaha	.60

Account closed to

Aug. 24, 1908.

Aug. 7, 1908

RR fare to Burlington	\$ 1.54
Hotel	1.00
car fare	.10
Return to Iowa City	1.54
	<u>\$ 3.68</u>

Aug. 9, 1908.

Hack, Iowa City	\$.25
RR fare to Des Moines	2.41
Hotel	.50
RR fare to Council Bluffs	2.86
RR fare to Mo. Valley -	.43

Aug. 10, 1908 (Mo. Valley)

Bottles & corks -	.10
Vials & corks -	.10
Fruit jar ⁵ , glass tubes ¹⁵ , file ⁵	.25
5 ft. measure (rule) line	.40
Note book ⁵ , manila ⁵	.10

Aug. 12, 1908 (Mo. Valley)

Pins ⁵ , Thread ⁵ , cheese cloth ⁵ , rubber bands ⁵	.20
Clips ⁵ , ruler ⁵	.10

Aug. 12 - RR fare to Logan	.17
Two meals	1.00
Return	.17

Aug. 13 -

Aug. 14 - RR to & from Logan	.34
Two meals	1.00

" 15 - Corks, tubes, & bottles	.20
Fare to Omaha ex. Bluffs. Car fare ²⁰	.43 + 70 = 1.13
Hotel Union	1.00

Order
1- ~~Psychoneurosis~~
2- Psycho, "5 min
3- 14 min - ~~long~~
4- Psycho

